





THE S

BALDW

WITH AN INDEX.



PUBLISHED UNDER THE SUPERINTENDENCE OF
THE SOCIETY FOR THE DIFFUSION OF USEFUL KNOWLEDGE.

LONDON:
BALDWIN AND CRADOCK, PATERNOSTER-ROW.

MDCCCXII.

LONDON:

Printed by WILLIAM CLOWES and SONS,
Stamford Street.

empire. To the
information, the
courteously gra
tion to Mr. Ber
be soon forgot

He has en
account of the
to please every
for long exper
peculiar to ear
statement of t
or of any vari
the general ma
on "British F
the Society.

The diseases
he painfully fe
subject. One
eases of the h
the absence of
principal veter
cultural societi
left to the tend
ture, the true
even the very

With the fe
worthily devo
author entered
assistance whic
establishing.

empire. To those noblemen and agriculturists from whom he derived information, the more highly estimated by him, because most readily and courteously granted, he begs to return his warmest thanks. His obligation to Mr. Berry, for the admirable history of the Short-Horns, will not be soon forgotten.

He has endeavoured to lay before the public an accurate and faithful account of the cattle of Great Britain and Ireland. He does not expect to please every one who reads his work or who has contributed towards it; for long experience has taught him that, although there is some excellence peculiar to each breed, there is none exempt from defect; and the honest statement of this defect will not satisfy the partisan of any one breed, or of any variety of that breed. He has passed lightly over the subject of the general management of cattle, in order to avoid trenching on the work on "British Husbandry," now publishing under the superintendence of the Society.

The diseases of cattle was a favourite topic with the writer, but here, he painfully felt the deficiency of materials for a treatise worthy of such a subject. One branch of veterinary science has rapidly advanced. The diseases of the horse are better understood and better treated; but, owing to the absence of efficient instruction concerning the diseases of cattle in the principal veterinary school, and the incomprehensible supineness of agricultural societies, and agriculturists generally, cattle have been too much left to the tender mercies of those who are utterly ignorant of their structure, the true nature of their diseases, the scientific treatment of them, and even the very first principles of medicine.

With the few practitioners scattered through the country, who had praiseworthy devoted themselves to the study of the maladies of cattle, the author entered into correspondence; and he derived from them a liberal assistance which does honour to the profession whose character they were establishing.

With regard to the maladies of the ox, so often grossly
amefully treated, he may have succeeded in laying
which will guide the farmer and the practitioner
heretofore perplexing and almost uniformly fatal
have laid the foundation for a better work, when com-
gard to the best interests of husbandry, shall have
to encourage, or rather to demand a higher degree
in veterinary practitioners, and shall have founded
those schools for professional instruction in every
ary art which have been successfully established, and
ered on the continent.

W. YOUATT.

x Hospital,

His Zoologica

No satisfactor
Devon ox—The
—the Swiss cow
cattle—those of
horns—the mi
natives retreat

The North
test—Lord W
Devon ox—his
attempted cross
cattle—principa
Dorset—SOMERS
of character—the
—description of
ties—experiment
in the hilly distr
double—SUSSEX
cow—crosses—W
Welsh cattle—P
late improvemen
DIGANS—Cattle
ANGLESRY cattl
tions—The Can
SCOTLAND—the
—early anecdote
the tacksman—
—BUTE—ARGYL
NESS—the ferry
HIGHLAND cattl
ORKNEYS—CAITH
of the cattle—di
husbandry—diff
peculiarity of the
BANFF—the Ban
tion of the cat
DINESHIRE—the
horned breed—
PERTH—charact
tish Bakewell—
grounds—the Ayr
of the county fift
value as dairy-cow
of the Ayrshires—

No satisfactory description of cattle by early writers—The Lancashire and Devon ox—The ox of central Africa—the backley of Southern Africa—the Scotch—the Swiss cows—Return to our native cattle—in the feudal times—occasional cattle—those of Chillingham Park—Present cattle classed according to the size of horns—the middle-horns probably the original breed—they are found where natives retreated from their invaders—essentially the same wherever found.

CHAPTER III.—THE MIDDLE-HORNS.

The NORTH DEVONS—The proper form and shape of cattle—the Devons tried by test—Lord Western's cattle—the Devonshire cow—the working properties of Devon ox—his disposition to fatten—Experiments—value of the cow for the dairies—attempted crosses—the Vale of Exeter—South Devon cattle—clouted cream—Cornwall cattle—principally North Devons—crosses—DORSETSHIRE cattle—mixture of Devon and Dorset—SOMERSETSHIRE cattle—pure Devons on the borders of Devon—gradual change of character—the old Somersets—the present cattle—Cheddar cheese—The Herefords—description of them—comparison between them and the Devons—fattening properties—experiments—GLOUCESTERSHIRE cattle—the old Gloucesters—the present breeds in the hilly district—in the vale of Berkeley—crosses—Gloucester cheese—single and double—SUSSEX cattle—description—comparison with Devons and Herefords—Sussex cow—crosses—West Sussex cattle—KENTISH cattle—WALES—general character of Welsh cattle—PEMBROKES—GLAMORGANS—former character of them—present breeds—late improvement—Mr. David's breed—MONMOUTHSHIRE cattle—CARMARTHENS—CARDIGANS—Cattle of BRECKNOCKSHIRE and RADNORSHIRE—Cattle of NORTH WALES—ANGLESEY cattle—the passage of the Menai—crosses—improvements—Welsh traditions—The CARNARVONS—The cattle of MERIONETH, MONTGOMERY, DENBIGH, FLINT—SCOTLAND—the WEST HIGHLAND cattle—the HEBRIDES—Description of the true Kyle—early anecdotes—Mr. Moorhouse—Hebridean management—The outer Hebrides—the tacksman—ARRAN—the Duke of Hamilton's improvements—general management—BUTE—ARGYLESHIRE—the cattle—rearing—Cantire—dairy-management—INVERNESS—the ferry of Kyle-Rhea—the shealings—overstocking—the trysts—NORTH HIGHLAND cattle—the SHETLANDERS—description—management—the Holmes—ORKNEYS—CAITHNESS—Sir John Sinclair's valuable improvements—present character of the cattle—diseases—strange superstitions—SUTHERLAND—introduction of sheep husbandry—different breeds—management—superstitions—Ross and CROMARTY—peculiarity of the cattle—Mr. Mackenzie's valuable account of Ross—NAIRN, MORAY—BANFF—the Banffshire breed—Lord Findlater's improvements—ABERDEEN—description of the cattle—the Kintore ox—the polled cattle—the Buchan cows—KINCARDINESHIRE—the Mearns ox—the cottar of the present and olden time—ANGUS—the horned breed—FIFE—description of the cattle—origin—the Durhams in Fife—PERTH—character of the cattle—STIRLING—the Carse—David Dun, the Scottish Bakewell—Falkirk tryst—KINROSS, CLACKMANNAN, DUMBARTON—the wintering grounds—the Ayrshires in Dumbarton—their produce—RENFREW—AYRSHIRE—State of the county fifty years ago—present state—cattle—opinions of their origin—the value as dairy-cows—produce—profit—boyening—Dunlop cheese—fattening properties of the Ayrshires—management—calves—LANARK—the Strathaven veal—the Willoughby

middle-horns—the Kerry cow—the prevailing breed were pro-
vement slower in Ireland than in England—Mr. Waller's
—Lord Masserene—Lord Farnham—the Earl of Rosse—Sir
Conolly—modern improvers — exportation of Irish cattle—
utter.

CHAPTER VI.—THE LONG-HORNS.

188

n—the larger and smaller breed—early improvers—the black-
Thomas Gresley—Mr. Webster—Bloxedge—Robert Bakewell
cess—anecdotes—errors of his successors—Twopenny—Mr.
Description of D—Mr. Fowler's sale—Mr. Prinsep—Mr.
the improved Leicesters—strangely rapid deterioration and
WESTMORELAND—LANCASHIRE—the native breed now rarely
ion of short-horns—Mr. Kirk's long-horns—DERBYSHIRE—
ESHIRE breed injured by the introduction of short-horns—
y—Cheshire cheese—NOTTINGHAMSHIRE—LEICESTERSHIRE—
—CAMBRIDGE—Cambridge butter—NORTHAMPTON—BED-
Woburn—BUCKINGHAMSHIRE—BERKSHIRE—HAMPSHIRE
t—WILTSHIRE—the long-horns almost extinct—crosses of all
RD SHIRE—WARWICKSHIRE—WORCESTERSHIRE—STAFFORD-
—the Staffords of the present day—introduction of the short-
the old Shropshires—the present breed.

CHAPTER VII.—THE SHORT-HORNS.

226

d breed—Sir W. Quentin—Mr. Milbank—Mr. C. Colling—
Hubback—Favourite—the Durham ox—cross with the polled
—Johanna—Lady—prices fetched by Lady's progeny—sale of
Mr. R. Colling—sale of his stock—Mr. Change of Newton—
Mr. G. Coates's Short-Horn Herd-Book—history of remark-
Althorp a successful breeder—the milking properties of the
ndervalued—not calculated for work—Lord Althorp's bull
orkshire cow—she unites the two qualities—quantities of
scription of her—CUMBERLAND—Mr. Bates first crossed the
orns—Mr. Maynard's experiments—YORKSHIRE—NORTH
black cattle alone—succeeded by the old Holderness—crossed
—WEST RIDING—every variety of cross in it—Mr. Mitton's
G—LINCOLNSHIRE—the unimproved Lincolns—the Turn-
d Lincolns—the Lincolnshire ox—ESSEX—the calf-feeding—
ter—Epping sausages—MIDDLESEX—Booth's establishment
er of cattle sold in Smithfield—how supplied—cruelties prac-
of cows kept in London—the milk-business—Laycock's dairy
Y.

—THE FOREIGN BREEDS OF CATTLE.

266

ity and excellence of milk, fattens readily—Najore cattle
tle.

CHAPTER X.—

The nasal b
nose—leeches i
lips—the tars
dicated by the
thrush in the
barbs or paps—

CHAPTER XI.—

The muscles
—arteries of th
with reference
—the pulse—t
ter-evil—black
form of the che
form and direct
the larynx—the
the sweetbread
nant epidemic
throat—inflam
tude of worms o
of the lungs—a
sumption—impo

CHAPTER XII.—

The peculiar
—stricture of the
—the reticulum
stomach—the ce
yield to a solid s
the third and fou
in the rumen—
—its honeycomb
reascends the g
plus—the leaves o
in the paunch—
gas—hoove—the
corrosive sublim
bound—fardel-bo
vomiting.

CHAPTER XIII.—

Anatomy and fu
—inflammation of

CHAPTER X.—THE ANATOMY, USES, AND DISEASES, OF THE NOSE, TRILS AND MOUTH.

The nasal bones—sense of smelling more acute than the horse—bleeding from nose—leeches in it—polypus—coryza—glanders—farcy—The bones of the mouth—lips—the bars of the mouth—the pad teeth in the upper jaw—the teeth—the age indicated by them—the long tongue of the ox—the os hyoides—gloss-anthrax or blain thrush in the mouth—the glands and blood-vessels of the neck—the parotid glands—barbs or paps—the soft palate—the pharynx.

CHAPTER XI.—ANATOMY AND DISEASES OF THE NECK AND CHEST.

The muscles of the neck and chest—the crest of the bull—form and size of the neck—arteries of the neck—bleeding—the fleam preferred—bleeding places—the milk-vessels with reference to bleeding—The heart—inflammation of its bag—the bone of the heart—the pulse—the capillary vessels—inflammation—Fever—inflammatory fever—quarter-evil—black quarter—typhus fever—the veins—varicose veins—The structure and form of the chest—the brisket—indications of its different forms—The ribs—proper form and direction of—the spine—reasons of its difference from that of the horse—the larynx—the round curled form of the epiglottis—the windpipe—tracheotomy—the sweetbread—the bronchial tubes—catarrh or hoove—epidemic catarrh—the malignant epidemic—murrain—long account of the epidemics of different times—the throat—inflammation of the pharynx—puncturing the pharynx—bronchitis—multitude of worms often found in the air-passages—bronchitis in Jamaica—inflammation of the lungs—acute pneumonia—epidemic ditto—pleurisy—chronic pleurisy—consumption—importance of recognizing the peculiar cough of consumption.

CHAPTER XII.—THE STRUCTURE AND DISEASES OF THE GULLET AND STOMACH.

The peculiar structure of the gullet of ruminants—choking—the œsophagus—proboscis—stricture of the gullet—rupture of ditto—the œsophagean canal—the rumen or paunch—the reticulum or honeycomb—the manyplus or manifolds—the abomasum or fourth stomach—the œsophagean canal continued—the muscular pillars of its floor—their yield to a solid substance—circumstances under which fluids pass over them in the third and fourth stomachs, or between them into the rumen—the food macerated in the rumen—passes through all the compartments of it—thrown into the reticulum—its honeycomb structure—the pellet formed—forced into the œsophagean canal—reascends the gullet—remasticated—returned—passes along the canal into the manyplus—the leaves of the manyplus—the fibrous parts of the food—indigestible substances in the paunch—concretions in ditto—distention of the rumen from food—ditto from gas—hoove—the stomach-pump—the chloride of lime—loss of cud—poisons—yew—corrosive sublimate—diseases of the reticulum—diseases of the manifolds—cleaveland bound—fardel-bound—malformation of manyplus—diseases of the fourth stomach—vomiting.

CHAPTER XIII.—THE ANATOMY AND DISEASES OF THE SPLEEN, LIVER, AND PANCREAS.

Anatomy and function of the spleen—inflammation of it—enlargement—The liver—inflammation of it—hæmorrhage—jaundice or yellows—The pancreas.

feeding—like produces like—comparative influence of sire and
the soil and climate—utility—good feeding—how far in and in—
symptoms of pregnancy—treatment before calving—natural
—mechanical assistance—unnatural presentation—free-mar-
ration—embryotomy—inversion of the womb—rupture of ditto
bladder—retention of the fœtus—attention after calving—the
tapping after calving—puerperal or milk fever—sore teats—

THE DISEASES AND MANAGEMENT OF CALVES. 557

—diarrhœa—hoove—castration—French method of castration.

THE DISEASES OF THE MUSCULAR SYSTEM AND THE EXTREMITIES. 562

ings of the joints—ulcers about the joints—opened joints—
feet—foul in the feet—shoeing.

XIX.—THE DISEASES OF THE SKIN. 570

—sensible and insensible perspiration—hide-bound—mange—
—angle-berries—warts.

LIST OF THE MEDICINES USED IN THE TREAT- MENT OF THE DISEASES OF CATTLE. 577

—purgatives—alteratives—alum—ammonia—anodynes—antimonial pow-
der of antimony—antispasmodics—astringents—blisters—calamine
—camphor—cantharides—carraways—castor oil—catechu—caustics
—charges—chloride of lime—clysters—cordials—corrosive subli-
—oretics—digitalis—diuretics—drinks—elder—emetic tartar—
—tinctures—gentian—ginger—Glauber's salts—Goulard's extract—
—ipecacuanha—laudanum—linseed—linseed oil—lunar caustic
—ointment—mint—myrrh—nitre—pitch—poultices—ergot of rye
—spirit of nitrous ether—spirit, rectified—sugar of lead—sul-
—phuric, common—turpentine, spirit of—vinegar—white lead

as to the numbering of some of the Chapters in the body of the
e to the pages in which the respective subjects are considered

If this v
general m
with our
and coura
in 'cattle'
with the
vidually s
much grea
Britain co
than eigh
One hu
Smithfield
casses sent
tenth part
1,600,000
of the ox or
10l. per he
pigs, and
year, and
allow only
and pigs,
the sheep
forty millio
sheep and s
Although
breed and th
struction is
tempted to
them his ow
there has be
the English
the preventi
any depende
and lambs d
the rot alone
of the neat c
red water, hoc
ten millions
go for inform

IF this volume of 'The Farmer's Series' is devoted to the history, general management, and medical treatment of an animal less connected with our commerce and our pleasure, and less endowed with intelligence and courage, and many a noble quality, than 'the horse,' we shall yet find in 'cattle,' a subject more identified with our agricultural prosperity, with the comforts, and the very continuance of life. If an ox is not individually so valuable as a horse, yet, in the aggregate, cattle constitute a much greater proportion of the wealth of the country; for although Great Britain contains a million and a half of horses, she has to boast of more than eight millions of cattle, unrivalled in the world.

One hundred and sixty thousand head of cattle are annually sold at Smithfield alone, without including calves, or the *dead-market*—the carcasses sent up from various parts of the country. If we reckon this to be a tenth part of the cattle slaughtered in the United Kingdom, it follows that 1,600,000 cattle are sent to the butcher every year; and, averaging the life of the ox or the cow at five years, the value of British cattle, estimated at 10*l.* per head, will be eighty millions sterling. 1,200,000 sheep, 360,000 pigs, and 18,000 calves, are also sent to Smithfield in the course of a year, and if we reckon these to be a tenth of the whole number, and allow only two years as the average duration of the lives of sheep and pigs, and value the calves at 2*l.* 10*s.* each, the pigs at 2*l.*, the sheep at 1*l.* 10*s.*, we shall arrive at the additional sum of nearly forty millions; so that we may safely compute the actual value of cattle, sheep and swine, to be nearly 120 millions sterling.

Although much has been done by agricultural societies to improve the breed and the general treatment of these animals, and much valuable instruction is to be found scattered in many a volume, no one has yet attempted to collect these fragments of 'useful knowledge,' and to add to them his own experience; and in one very important part of our subject there has been the most unaccountable neglect, for there is scarcely in the English language a work on the preservation of the health, the prevention and cure of the diseases, of cattle and sheep, on which any dependence can be placed. Although a tenth part of the sheep and lambs die annually of disease (more than four millions perished of the rot alone in the winter of 1829—30), and at least a fifteenth of the neat cattle are destroyed by inflammatory fever and milk-fever, red water, hoose and diarrhœa; and the country incurs a loss of not less than ten millions of pounds annually, the agriculturist knows not where to go for information on the nature and the cure of the maladies of w

been written in different books respecting the peculiar breeds, and their adaptation to different purposes, it may be said to be characteristic of each, and on which mainly depends: but the opinions of the writers are in variance with each other; and the farmer too frequently is left of them puzzled rather than instructed, and even interested instead of being guided in its pursuit.

The present work will be the Natural History, the different uses, (more particularly with reference to their beauties and utility for various purposes, and the Diseases, and the Management of Cattle, with their most rational and successful methods, may be enabled to rouse the farmer to strive, and to strive, to rescue a few of his oxen from that destruction to which he is an almost passive spectator; and to direct his attention to the little farmer, and the cottager, as well as to the more influential individual,—to that which should not have been so utterly neglected, our main and most valuable object is accomplished.

CHAPTER I.

NATURAL HISTORY OF THE OX.

The CLASS *mammalia*, animals having mammæ, or teats (see p. 52); the ORDER *ruminantia*, ruminating, or chewing the cud; the TRIBE *bovidæ*, the ox kind; the GENUS *bos*, occupying the crest, projecting at first sideways, and then curved within; and the SUB-GENUS *bos taurus*, or the

According to their teeth, they have eight *incisors*, or cutting teeth, and none in the upper. They have no tusks, but four grinding teeth, in each jaw, and on each side. They therefore, be represented as follows:—(see ‘The

canines 0, molars $\frac{6}{6}$ - $\frac{6}{6}$. Total, 30 teeth.

The age of the ox, reckoning from the time of the flood, was

stituting
ham was
mention
The re
lication
the Egy
say that
gods, w
animated
among th
The p
the prese
mous and
of myster
of Englan
exceeding
British M
smaller o
degree in
native bre
tains and
dun cow,
will suffici
of that da
to individ
no doubt t
sively incr
agriculture
We will
Asia, nor t
cording to
towards the
be placed;
will procee

stituting one of the most valuable portions of their wealth. When Aham was in Egypt †, one hundred and eighty years before there is mention of the horse, Pharoah presented him with sheep and oxen.

The records of profane history confirm this account of the early domestication and acknowledged value of this animal, for it was worshipped by the Egyptians, and venerated among the Indians. The Indian legends say that it was 'the first animal that was created by the three king gods, who were directed by the Supreme Lord to furnish the earth with animated beings.' The traditions of every Celtic nation enrol the ox among the earliest productions, and represent it as a kind of divinity.

The parent race of the ox is said to have been much larger than any of the present varieties. The Urus, in his wild state at least, was an enormous and fierce animal, and ancient legends have thrown around him a veil of mystery. In almost every part of the Continent, and in every district of England, skulls, evidently belonging to cattle, have been found exceeding in bulk any now known. There is a fine specimen in the British Museum: the peculiarity of the horns will be observed, resembling smaller ones dug up in the mines of Cornwall, preserved in the same degree in the wild cattle of Chillingham Park, and not quite lost in the native breeds of Devon and East Sussex, and those of the Welsh mountains and the Highlands. The combat of Guy, Earl of Warwick, with a wild dun cow, the skull of which is yet preserved in the castle of Warwick, will sufficiently prove the comparatively large size of some of the wild cattle of that day. We have reason, however, to believe that this referred to individuals than to the character of the breed generally, for there is no doubt that, within the last century, the size of the cattle has progressively increased in England, and kept pace with the improvement in agriculture.

We will not endeavour to follow the migrations of the ox from Western Asia, nor the change in size, and form, and value, which it underwent according to the difference of climate and of pasture, as it journeyed towards the west, for there are no records of this on which dependence can be placed; (the historians of early days were poor naturalists;) but we will proceed to the subject of the present work, the British Ox.

* Gen. iv. 20.

† Gen. xii. 16.

casual exceptions, to have possessed no great bulk or have celebrated the intelligence, or fidelity, or some of almost every species of agricultural property but mingly stupid ox,—not so uninteresting, however, ted him to be, when he is closely observed, and his es watched.

st other animals, the creatures of education and circate them to give us milk, and to acquire flesh and fat. intelligence required for these purposes. It fares with other domesticated dependents, that when he has lost the forest, and become the slave of man, without ac- of being his friend, or receiving instruction from him, without being replaced by the semblance of reason. him into our immediate service,—when he draws our r land,—he rapidly improves upon us ; he is, in fact, at animal : when he receives a kind of culture at our o be enlightened with a ray of human reason, and ree of human affection. The Lancashire and the a not to belong to the same genus. The one has nd his way to and from his pasture ; the other rivals and docility, and often fairly beats him out of the field esty in work. He is as easily broken in, and he equals nd gratitude to his feeder.

other countries where the services of the ox are more education more complete, that we are to look for that lect, which his sluggish nature would scarcely promise the 1st vol. of his Travels into the Interior of Africa,

generally broken in for riding, when they are not more e first ceremony, is that of piercing their nose to re- which purpose they are thrown on their back, and a the septum, or cartilage between the nostrils, large inger. In this hole is thrust a strong stick stripped of at one end a forked bunch to prevent it passing end of it is fastened a thong of hide, of a length und the neck and form the reins ; and a sheep skin, ced across the back, together with another folded up, a rein long enough to pass several times round the saddle. To this is sometimes added a pair of stirrups, thong with a loop at each end slung across the sad- loops are distended by a piece of wood to form an

camels. I
from the m
sacks mad
able back.
and serves
his wife,
Shouaa w
animals,
sorts of f
an inch w
at the crow
fry,—she
her anim
her vanity
and curve
It is, ho
is complete
of the hor
quadruped
mestics, an
the protect
his flocks,
grazing, th
grazes bes
the backe
straying t
who atten
derers of t
backelies a
with a pro
enemy. B
strike down
attempts to
victory, be
‘ An ani
ward. Th
habit gains
to the brute
sagacity.
other ; and
him, by a c
joined with

from the markets. A small saddle of plaited rushes is laid on him, sacks made of goat skins, and filled with corn, are lashed on his broad back. A leather thong is passed through the cartilage of his nose and serves as a bridle, while on the top of the load is mounted the owner, his wife, or his slave. Sometimes the daughter or the wife of a Shouaa will be mounted on her particular bullock, and precede the load of animals, extravagantly adorned with amber, silver rings, coral, and all sorts of finery; her hair streaming with fat, a black rim of kohal, at least an inch wide, round each of her eyes, and I may say arrayed for conquest at the crowded market. Carpet or robes are then spread on her clumsy steed, and she sits *jambe de ça, jambe de là*,—and with considerable grace guides her animal by the nose. Notwithstanding the peaceableness of his nature, her vanity still enables her to torture him into something like capers and curvetings.

It is, however, in the southern part of Africa that the triumph of the ox is complete. His intelligence seems to exceed anything that we have of the horse, and he is but little inferior to that most sagacious of quadrupeds, the dog. Among the Hottentots, these animals are their domestics, and the companions of their pleasures and fatigues; they are the protectors and the servants of the Caffre, and assist him in attending his flocks, and guarding them against every invader. While the sheep are grazing, the faithful *backely*, as this kind of oxen is called, stands beside them. Still attentive, however, to the looks of its master, the *backely* flies round the field, obliges the herds of sheep that stray to keep within proper limits, and shows no mercy to robbers who attempt to plunder, nor even to strangers: but it is not the plunderers of the flock alone, but even the enemies of the nation, that the *backelies* are taught to combat. Every army of Hottentots is furnished with a proper herd of these creatures, which are let loose against the enemy. Being thus sent forward, they overturn all before them; strike down with their horns, and trample with their feet, every one who attempts to oppose them, and thus often procure their masters an easy victory, before they have begun to strike a blow.

‘An animal so serviceable is, as may be supposed, not without its reward. The *backely* lives in the same cottage with its master, and by habit gains an affection for him; for in proportion as the man approaches to the brute, so the brute seems to attain even to the same share of human sagacity. The Hottentot and his *backely* thus mutually assist each other; and when the latter happens to die, a new one is chosen to succeed him, by a council of the old men of the village. The new *backely* is joined with one of the veterans of his own kind, from whom he learns

er once straying beyond the forbidden bounds, and
e the cows in a threatening attitude if they ap-
length his honesty and vigilance became so obvious,
ployed in weeding, and other business, without fear
in his absence.'—*Instinct Displayed*, Letter 34.

in his *Travels in Colombia*, vol. ii. p. 251, places
not uninteresting point of view: 'I was suddenly
terrific noise, a mixture of loud roarings and deep
most appalling effect at so late an hour. I imme-
ended by the Indians, when I found close to the
of bullocks collected from the surrounding country;
d the spot where a bullock had been killed in the
peared to be in the greatest state of grief and rage:
ned, they tore the ground with their feet, and bel-
us chorus that can be imagined, and it was with the
y could be driven away by men and dogs. Since
d the same scene by daylight, and seen large tears
cheeks. Is it instinct merely, or does something
them by the blood, that one of their companions
I certainly never again wish to view so painful a
appeared to be reproaching us.'

ne of the good qualities of superior animals, or even
likewise have some of his failings. Vanity forms as
ibute of the female of this species, as of some others.
wiss cows is not a little amusing, although we be-
hat exaggerated:—

on of Appensell, pasturage being the chief employ-
s, the breeding of cattle, and the subsequent manage-
carried to the greatest perfection. The mountaineer
a perpetual exchange of reciprocal acts of kindness;
almost every requisite he needs, and in return they
cherished by him, and sometimes more so than his
are never ill-treated nor beaten, for his voice is suffi-
vern the whole herd, and there reigns a perfect cor-

ine cattle are the pride of their keepers, who adorn
an harmonious set of bells, chiming in accordance
anz des vaches. The finest black cow is adorned
and the two next in appearance wear smaller ones.
hen they are removed to the Alps, or to some change
es himself in all his finery, and proceeds along,

secured
entirely
Havi
subject
the Ro
tillage,
account
pation
was di
and tha
approac
soverei
contin
propert
castle, o
visions
and the
demesne
When th
and the
remained
six hund
When
and pro
equally
ductions
labour o
neglected
nished, a
within th
made ma
In the
ancestors
was then
recesses
by degre
the neigh
of them
Strange s
they were
vanced, a

entirely removed from the herd.'—*Illustrations of Natural History*

Having thus somewhat vindicated the intellectual power and worth of the subject of our work, we return to the agricultural state of the country when the Romans invaded Britain. Cæsar tells us, that the Britons neglected tillage, and lived on milk and flesh; and other authors corroborate the account of the early inhabitants of the British Islands. It was the occupation and mode of life which suited their state of society. The country was divided into many petty sovereignties; no fixed property was held, and that alone was valuable, which might be hurried away at the threatened approach of an invader. Many centuries after this, when, although a sovereign seemed to reign paramount over the whole of the kingdom, continued to be endless contests among the feudal barons, and still no property alone was valuable which could be secured within the walls of a castle, or driven beyond the invader's reach, an immense stock of provisions was always stored up in the various fortresses, both for the sustenance of the army and the cattle; or it was contrived that the latter should be driven into the demesnes of some friendly baron, or concealed in some inland fastness. When the winter had passed over in the castle of one of the Desp'ers, and the usual stock of provisions was comparatively exhausted, there remained in salt in the latter part of the spring, no fewer than eighty six hundred bacons, and six hundred sheep.

When, however, the government became more powerful and the property of every kind was proportionably secured, as well as the land equally divided, the plough came into use; and those agricultural productions were oftener cultivated, the reaping of which was sure after the labour of sowing had been expended. Cattle were now comparatively neglected, and for some centuries injuriously so. Their numbers diminished, and their size appears to have diminished too; and it is not within the last fifty years that any serious and successful efforts have been made materially to improve them.

In the comparative roving and uncertain life which our earlier ancestors led, their cattle would sometimes stray and be lost. The country was then overgrown with forests, and the beasts betook themselves to the recesses of these woods, and became wild, and sometimes ferocious. They by degrees grew so numerous, as to be dangerous to the inhabitants of the neighbouring districts. One of the chronicles informs us, that a great number of them harboured in the forests in the neighbourhood of the metropolis. Strange stories are told of some of them, and doubtless, when irritated, they were fierce and dangerous enough. As, however, civilization advanced, and the forests became thinned and contracted, these animals

weight of the oxen is from thirty-five to forty-five
from twenty-five to thirty-five stone the four quarters
stone). The beef is finely *marbled*, and of excellent
nature of their pasture, and the frequent agitation
the curiosity of strangers, it is scarcely to be expected
at; yet the six years old oxen are generally very
it may be fairly supposed, that in proper situations

ance of any person they set off in full gallop, and,
out two hundred yards, make a wheel round, and
tossing their heads in a menacing manner; on a
l stop at the distance of forty or fifty yards, looking
their surprise; but upon the least motion being
urn round, and fly off with equal speed, but not to
ming a shorter circle, and again returning with a
atening aspect than before; they approach much
in thirty yards, when they again make another
this they do several times, shortening their dis-
nearer and nearer, till they come within such a
most people think it prudent to leave them, not
em further.

g them was perhaps the only remains of the gran-
g. On notice being given that a wild bull would
day, the inhabitants of the neighbourhood came
with guns, &c., sometimes to the amount of an
or five hundred foot, who stood upon walls, or
e horsemen rode off the bull from the rest of the
bay, when a marksmen dismounted and shot. At
twenty or thirty shots have been fired before he
ch occasions the bleeding victim grew desperately
ings of his wounds and the shouts of savage joy
every side. But, from the number of accidents
dangerous mode has not been practised of late years;
generally shooting them with a rifle gun at one

re, they hide their calves for a week or ten days in
tion, and go and suckle them two or three times
come near the calves, they clap their heads close
like a hare in form, to hide themselves: this is a
wildness, and is corroborated by the following cir-

almost as
breeders.
to the c
as our c
Bakewell
the midd
proved in
colnshire
farmer
and the
but a dis
north of
of dimin
of the
crumpled
in gentle
or hornle
they were

These,
are found
opulent a
often diff
enough,
farmers,
in spite
substitut

The c
value of
sidered b
ment of c
cattle. T
middle a
claim; t
it has ex
accident

We a
horns.'
we shall
Britain
although
and subj

almost as numerous as the horn of the different districts, or the fancies of breeders. They have, however, been very conveniently classed according to the comparative size of the horns :—the *long horns*, originally, as our country is concerned, from Lancashire, much improved by Bakewell of Leicestershire, and established through the greater part of the midland counties ;—the *short horns*, originally from East Yorkshire, improved in Durham, mostly cultivated in the northern counties and Lincolnshire, and many of them found in every part of the kingdom where the farmer attends much to his dairy, or a large supply of milk is wanted; and the *middle horns*, not derived from a mixture of the two preceding, but a distinct and valuable and beautiful breed, inhabiting principally the north of Devon, the East of Sussex, Herefordshire, Gloucestershire, and of diminished bulk, and with somewhat different character, the *crumpled horn*, of the Scottish and the Welsh mountains. The Alderney, with its *crumpled horn*, is found on the southern coast, and, in smaller numbers, in gentlemen's parks and pleasure-grounds everywhere; while the *hornless* cattle, prevail in Suffolk and Norfolk, and in Galloway, where they were first derived.

These, however, have been intermingled in every possible way. They are found pure only in their native districts, or on the estates of opulent and spirited individuals. Each county has its own mongrel, often difficult to be described, and not always to be traced—nevertheless, enough, yet suited to the soil and to the climate; and, among farmers, maintaining their station, and advantageously maintaining it, in spite of attempts at supposed improvements by the intermixture and substitution of foreign varieties.

The character of each, so far as it can be described, and the value of each for breeding, grazing, the dairy, or the plough, will be considered before we inquire into the structure or general and medical management of cattle. Much dispute has arisen as to the original breed of cattle. The battle has been stoutly fought between the advocates of the middle and the long horns. The short horns and the polls can hardly claim; the first is evidently of foreign extraction, and the latter, although it has existed in certain districts from time immemorial, was probably an accidental variety.

We are very much disposed to adjudge the honour to the '*long horns*.' The *long horns* are evidently of Irish extraction, as in due season we shall endeavour to show.

Britain has shared the fate of other nations, and, oftener than although defended by the ocean on every side, she has been conquered and subjugated by ferocious invaders. As the natives retreated before

le the occasional privations of Wales lessened the
hide of the Welsh runt. As for Scotland, it, in a
rs at defiance; or its inhabitants retreated for a
again on their pursuers. They were proud of their
their cattle, their choicest possession; and there,
served, unmixed and undegenerated.

that in Devon, in Sussex, in Wales, and in Scot-
en the same from time immemorial; while in all
through every district of Britain, the breed of cattle
lost its original character: it consisted of a variety
m every neighbouring and some remote districts,
ole variety, yet generally conforming itself to the

ation will convince us that the cattle in Devon-
d Scotland, are essentially the same. They are
le, but not extraordinary milkers, and remarkable
han the quantity of their milk; active at work;
ed aptitude to fatten. They have all the cha-
reed, changed by soil and climate and time, yet
ntermeddling of man. We may almost trace the
of the Devon, the Sussex, and the Hereford; and
alone are now found, the memory of the red
of superstitious reverence attached to it in the
; and in almost every part of Scotland, and in
of Wales, the milk of the *red cow* is considered
ery disease, and a preservative from every evil.
ad opportunities of comparing the Devon cattle
Chatelherault Park, or Chillingham Castle, has
great resemblance in many points, notwithstand-
our, while they bear no likeness at all to the cattle
ntry.

consider the middle horns to be the native breed
ey shall first pass in review before us.

mixed, and
Inland it e
Tiverton,
quent, or
Somerset
there prev
the Some
minate th
confines t
be found
county.
south, is

From
quite as p
until with
is rememb
country, a
shire cattl
Dorset, a
country a
the Exete
March, a
them to
who kee
shire gr
of the N
set and I

The t
nearly th
any thing
they bou
fifty or s
prove th
acknowl
with su

* Lord
judge of
acquainted
curate and
would refer

mixed, and at length comparatively lost before we arrive at the Inland it extends by Barnstaple, South Molton, and Chumleigh, as Tiverton, and thence to Wellington, where again the breed becomes frequent, or it is mixed before we reach Taunton. More eastward the Somersets and the Welsh mingle with it, or supersede it. To the north there prevails a larger variety, a cross probably of the North Devon and the Somerset; and on the west the Cornish cattle are found, or contaminate the breed. The true and somewhat prejudiced Devonshire farmer confines them within a narrower district, and will scarcely allow them to be found with any degree of purity beyond the boundaries of his county. From Portlock to Biddeford, and a little to the north and south, is, in his mind, the peculiar and only residence of the North Devon.

From the earliest records the breed has here remained the same; or quite as perfect as at the present moment, yet altered in no essential until within the last thirty years*. That is not a little surprising when it is remembered that a considerable part of this district is not a Devonshire country, and that even a proportion, and that not a small one, of Dorsetshire cattle, are bred out of the county. On the borders of Somerset and Dorset, and partly in both, extending southward from Crewkerne, the country assumes the form of an extensive valley, and principally supplies the Exeter market with calves. Those that are dropped in February and March, are kept until May, and then sold to the drovers, who carry them to Exeter. They are there purchased by the Devonshire farmers, who keep them for two or three years when they are sold to the Somersetshire graziers, who fatten them for the London market; so that a portion of the North Devon, and of the very finest of the breed, come from Somerset and Dorset.

The truth of the matter is, that the Devonshire farmers were, nearly the close of the last century, not at all conscious that they possessed any thing superior to other breeds; but, like agriculturists everywhere, they bought and bred without care or selection. It is only within the last fifty or sixty years that any systematic efforts have been made to improve the breeds of cattle in any part of the kingdom; and we must acknowledge, that the Devonshire men, with all their advantages, and with such good ground to work upon, were not the first to stir

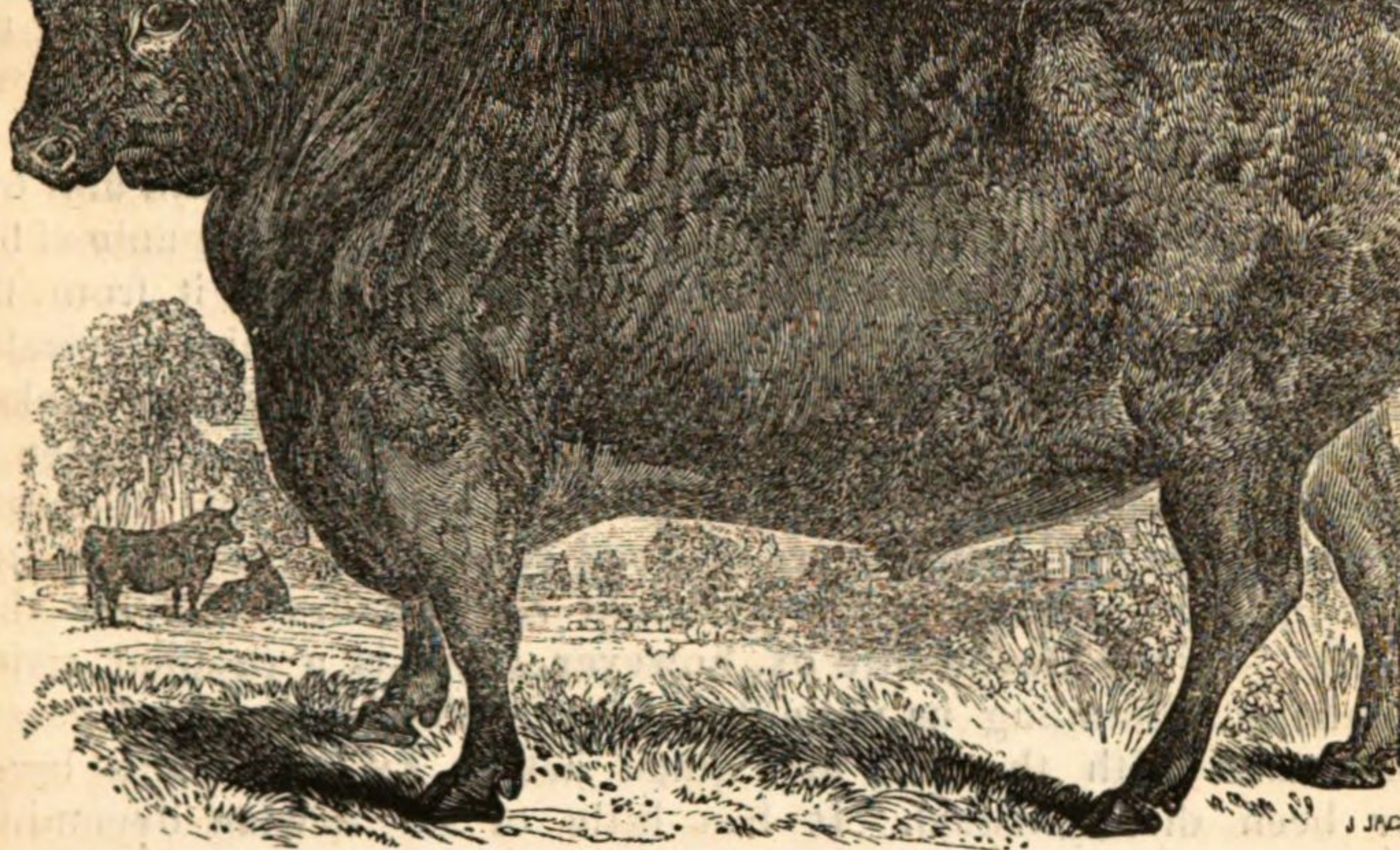
* Lord Somerville, a name justly esteemed among agriculturists, and an excellent judge of cattle, and who, from his residence in the county, may be supposed to be well acquainted with the excellencies and defects of this breed, gives a long and accurate and interesting account of them in the *Annals of Agriculture*, to which I would refer the reader.

one part of the frame, the form of which, more
ers the animal valuable, it is the chest. There
or the heart to beat, and the lungs to play, or
purposes of nutriment and of strength will not be
thoroughly undergo that vital change, which is
discharge of every function. We look, therefore,
and deep girth about the heart and lungs. We
proportion in which the one or the other may pre-
on the service we require from the animal; we
ree of flatness of the sides, for he will be lighter in
active; but the grazier must have width as well
y about the heart and lungs, but over the whole
ve both length and roundness; the *hooped*, as well
essential; there must be room for the capacious
materials from which the blood is to be provided.
be ribbed home; there should be little space be-
hips. This seems to be indispensable in the ox,
althy constitution, and a propensity to fatten; but
ng of the belly is excusable in the cow, or rather,
nishes the beauty of the animal, it leaves room for
also accompanied by swelling milk veins, it gene-
e in the dairy.

depth of the barrel, however, is most advantageous
und behind the point of the elbow, more than be-
d legs; or low down between the legs, rather than
withers: for it diminishes the heaviness before, and
f the coarser parts of the animal, which is always
ion.

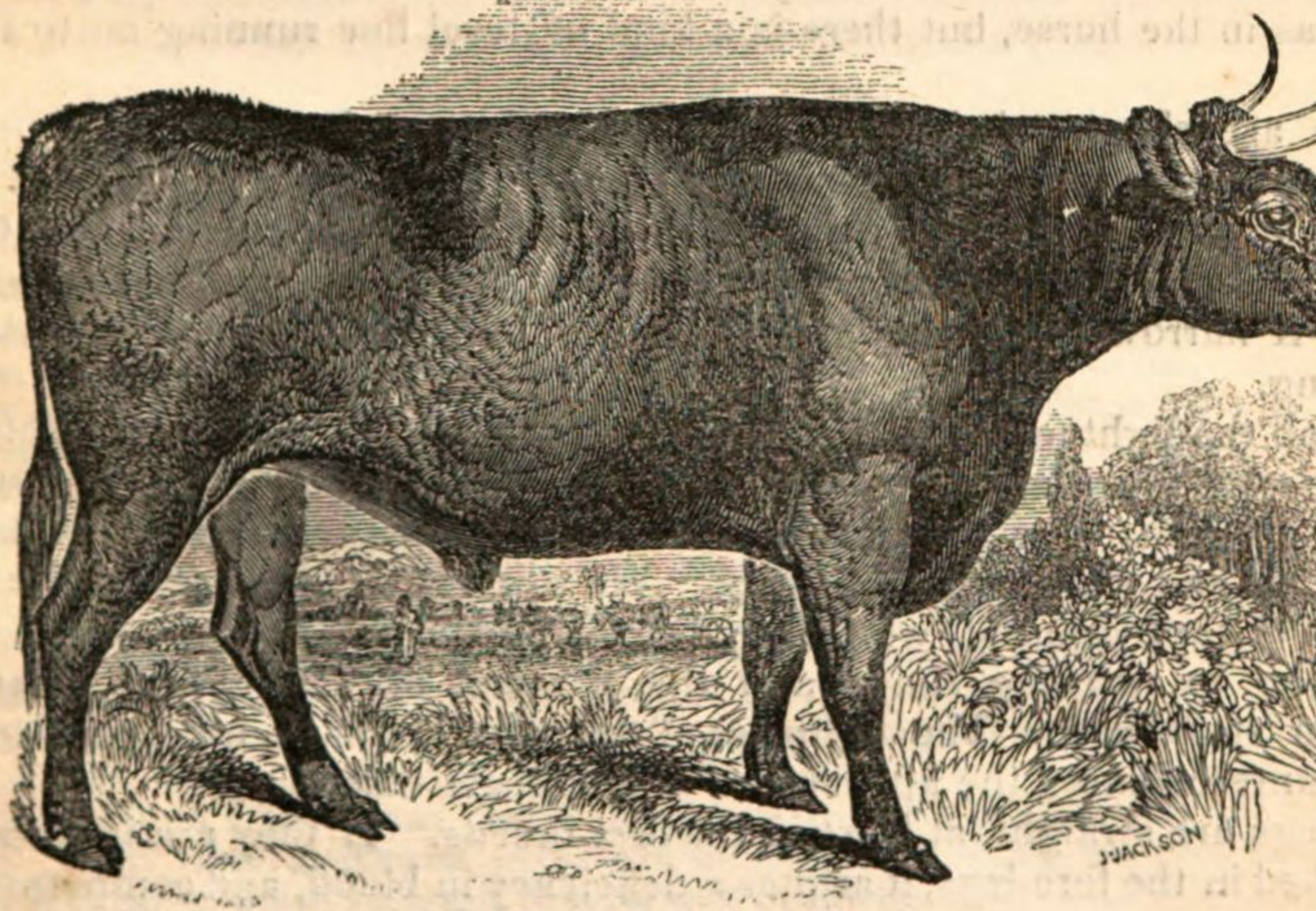
vide: of this there can be no doubt, for they are the
ld seem to extend far along the back: and although
ang down, the flanks should be round and deep.
erfluous to say that, without being ragged, they
l rather than wide, and presenting, when handled,
at. The thighs should be full and long, close toge-
behind, and the farther down they continue to be
gs short, varying like other parts according to the
al; but decidedly short, for there is an almost in-
between length of leg and lightness of carcase, and
propensity to fatten. The bones of the legs, and
as a sample of the bony structure of the frame
nall, but not too small—small enough for the well.

The m
tinguish
tapering
colour.



[*The Devon Bull.*]

The more perfect specimens of the North Devon breed are distinguished. The horn of the *bull* ought to be neither too low nor too tapering at the points, not too thick at the root, and of a yellow colour. The eye should be clear, bright, and prominent, showing



[*The Working Devon Ox.*]

we trace in this singular and noble animal, the and scarcely reclaimed British bull.

small, very singularly so, relatively to the bulk of striking breadth of forehead. It is clean and free. The eye is very prominent, and the animal has countenance plainly distinguishing it from the other breeds. Its neck is long and thin, admirably and even for the more common and ruder yoke. The fully arched form of the neck, which is seen in considered as a defect in most breeds of cattle. The characters of good cattle, that the line of the the withers should scarcely deviate from that of the Devonshire ox, however, there is a peculiar rising giving us not a little of the blood-horse, and essential to the free and quick action by which this breed is distinguished. It has little or no dewlap depending from the throat. Its horns are longer than those of the bull, smaller at the base, and of a lighter colour, and sometimes the animal is light in the withers; the shoulders are not so deep, and the bosom open and wide, parallel with the fineness of the withers. The fore-legs are like pillars that have to support a great weight. The knee is rarely or never seen. There is no projection at the knee, but there is a kind of level line running on to the

the most important points. Angular bony projection in a beast that carries much flesh and fat. The oblique direction of the shoulder, and the want of both strength and speed, and aptitude to do any kind of animal can never be useful either for working

of the Devonshire ox, there is a point about him, which is not always approved in the horse. The fore-legs are far under the chest, or rather the breast is before the legs. We see the advantage of this in the horse, who rarely breaks into a trot, except when he is in a hurry, and the division of whose foot secures the lightness of the other parts of his form, however the appearance of heaviness here.

at least in the best breeds. If they are in-kneed, it argues a deficiency in blood, and comparative

only to g
cessary t
There
line of t
there is
flat. It
while a
Not
ribs are
and othe
or huck
or lean
the run
very cor
room fo
swelling
connecte
modern
are of m
much ad
The se
much ele
blood-ho
itself is l
The s

* It is
between ex
tion; and
between th
farmers. T
Devonshire
stress, and
bones unde
of knowing
preserving
and lighter
but he is a
the true D
blood by a
his prejudic
among the
farmer. H
narrow and
meat. Wh
referred to c

cessary to get him pleasantly and actively over the ground.

There is a very trifling fall behind the withers, but no *hollowness*, a line of the back is straight from them to the setting on of the tail; there is any seeming fault in the beast, it is that the sides are a little flat. It will appear, however, that this does not interfere with speed, while a deep, although somewhat flat chest is best adapted for speed.

Not only is the breast broad and the chest deep, but the twelve ribs are particularly bold and prominent, leaving room for the stomach and other parts concerned in digestion to be fully developed. The shoulders or huckles, are high, and on a level with the back, whether the beast is fat or lean. The hind quarters, or the space from the huckle to the point of the rump, are particularly long, and well filled up—a point like which is of very considerable importance both for grazing and working. It leaves room for flesh in the most valuable part, and, like the extensive swelling quarters of the blood-horse, indicate much power behind, connected with strength and speed. This is an improvement of modern date. The fulness here, and the swelling out of the thigh, are of much more consequence than the prominence of fat which is so much admired on the rump of many prize cattle.

The setting on of the tail is high; it is on a level with the back; it is much elevated, and never depressed. This is another great point in the blood-horse, as connected with the perfection of the hind quarters. The tail itself is long and small, and taper, with a round bunch of hair at the end.

The skin of the Devon, notwithstanding his curly hair, is excellent.

* It is sometimes not a little amusing to observe the seeming contrariety of opinion between excellent judges of cattle, and that on the very essential points of their conformation; and yet, when the matter is properly explained, the slight shade of difference between them. We have now lying before us letters from two very skilful Devonshire farmers. They have been so obliging as to give us their opinion as to the points in the Devonshire ox. One insists upon that, on which we confess we should lay very great stress, and without which we should reckon any beast almost valueless, namely, large bones under the knee, and a clean neck and throat. This gentleman we have the honor of knowing; he has been improving the size and weight of the Devonshire ox, and preserving these points: nay, we know that he did steal a cross from one of the finest and lightest Herefords he could procure. The other has sound principles of breeding, but he is a man of the old school: he had been educated in the belief that what was the true Devons are unrivalled, and he would deem it a kind of sacrilege to debilitate the blood by a cross with any other breed; yet experience has yet taught him, in spite of his prejudices, and although he will not own it, that the old Devons have their faults among them, too much flatness of chest and general lightness; he is, beside, a farmer. He tells us that he does not like a fine neck, because it is accompanied with a narrow and light breast, and that he does like large bones, because they will carry more meat. Why, these gentlemen were, in a measure, both right, but their observations were referred to cattle, which although Devons, were essentially different.

and dead, will be a sluggish worker, and an un-
e, however, that are of a yellow colour, are said
iarrhœa).

to the slightest intermixture of white—not even
l is allowed; yet a few good oxen have large dis-
but if the colours run into each other, the beasts
mongrel and valueless breed.

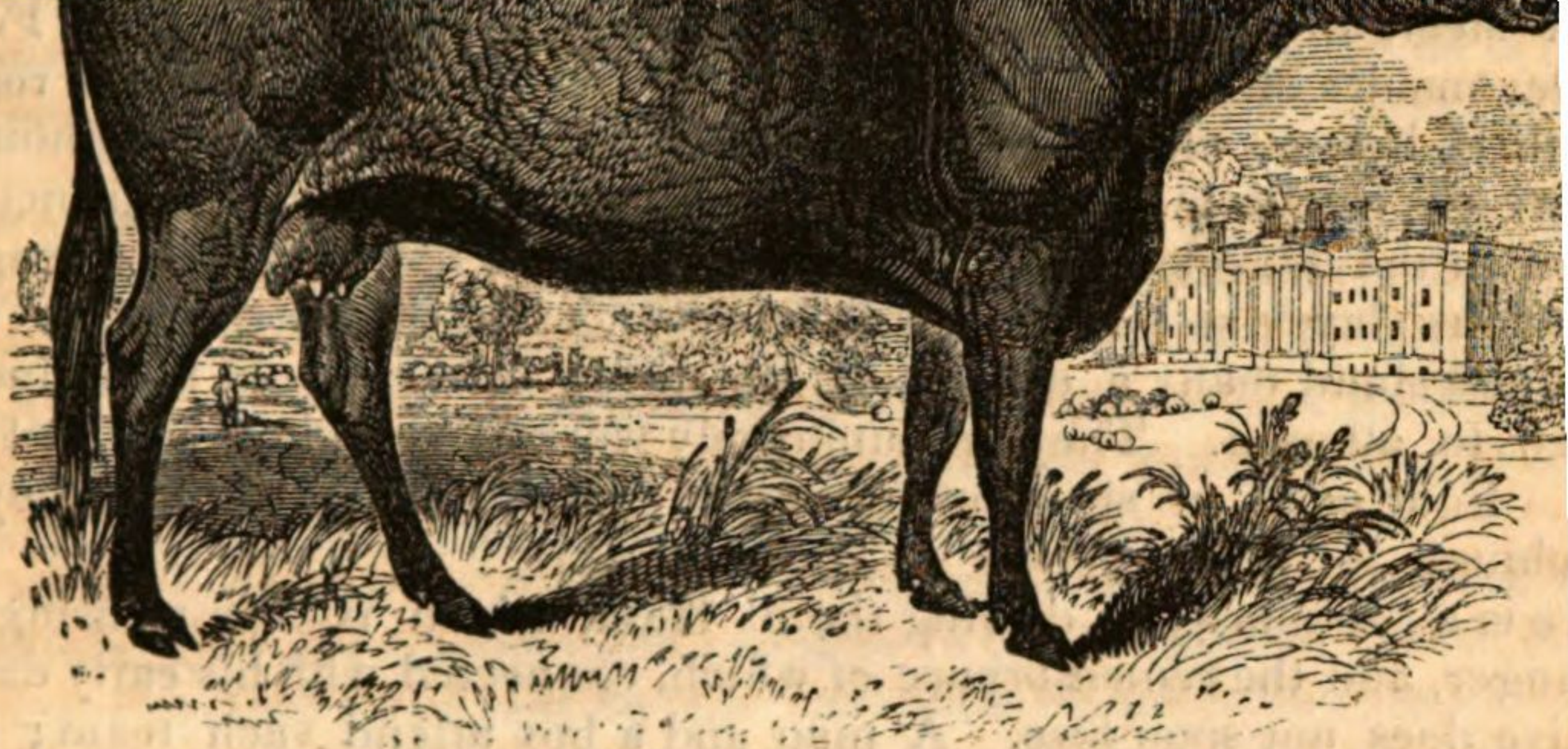
al points of a good Devonshire ox; but he used
et, a little too flat-sided, and the rump narrowed
ip bones; he was not sufficiently ribbed home, or
pace between the hip bones and the last rib; and
ght for some tenacious and strong soils. The cut
page 13, contains the portrait of one formerly
of Bedford. It embodies almost every good point
n.

adly enabled us here to add another portrait from
f the bull given at page 13, and is a faithful repre-
nning to fatten, but his characteristic points not
estern has carefully preserved this breed unmixed
s, and all the cattle that he fattens are Devons
the plough.



There
the con
the ox,
ever, is
it may
any ext
where o
procure
These c
tion of
than a
larly dis
round t
ear. Th
rest of th
jaws fre
of the b
having m
angles b
We an

* In the
provincial
cattle. 'E
from Portlo
small-horne
beasts thrive
tionable—b
there—the
from the po
up.' As a



There are few things more remarkable about the Devonshire cattle, than the comparative smallness of the cow. The bull is a great deal less than the ox, and the cow almost as much smaller than the bull. This, however, is some disadvantage, and the breeders are aware of it; for, although it may not be necessary to have a large bull, and especially as the bulls of any extraordinary size are seldom handsome in all their points, but where or other present coarseness or deformity, it is almost impossible to procure large and serviceable oxen, except from a somewhat roomy country. These cows, however, although small, possess that roundness and fullness of the two or three last ribs, which make them actually more so than a careless examination of them would indicate. The cow is particularly distinguished for her full, round, clear eye, the gold coloured skin round the eye and the same colour prevailing on the inside skin of the ear. The countenance cheerful, the muzzle orange or yellow, the rest of the face having nothing of black, or even of white about it. The jaws free from thickness, and the throat free from dewlap. The shape of the back and the hind quarters different from those of other breeds, having more of roundness and beauty, and being free from most of the angles by which good milkers are sometimes distinguished.

We are here enabled to present our readers with the portrait of

* In the 'Annals of Agriculture,' vol. xxx., p. 314, we have the opinion, in so provincial terms, of a good west-country grazier, respecting the best form of the cattle. 'He buys at all times, from Christmas to May-day, North Devons, that from Portlock to Biddeford, such as are five or six years old. He chooses such small-horned, and of a yellow-coloured horn rather than white—small bones, beasts thrive best—rib bones round, not flat—a thick hide bad—a very thin one objectionable—blade bones, chuck—very thick and heavy in the bosom, as much weight there—the heavier in the shoulder the better, but not to elbow out—very wide and from the points down to the thighs—middling in the belly—not cow-bellied—not up.' As a grazier he is right; but this is not the true working Devonshire ox.

gh two acres with a double-furrow plough. Four
s will do as much work in the field, or on the road,
and in as quick, and often quicker, time, although
two oxen to be equal to one horse. The principal
shire oxen is, that they have not sufficient strength
ils: they will, however, exert their strength to the
y a dead pull, which few horses could be induced
They are uniformly worked in yokes, and not in
six growing steers, are the usual team employed

y in driving the ox team, which is very pleasing to
membrance of which, connected with his early days,
on lose. A man and a boy attend each team; the
can scarcely be regarded as any distinct tune, but
ng succession of sounds, resembling the counter-
the cathedral. He sings away with unwearied lungs,
most from morning to night, while every now and
he directs the movement of the team, puts in his lower
ncord. When the traveller stops in one of the
ad hears this simple music from the drivers of the
of the hill on either side, he experiences a pleasure
husbandry could scarcely be supposed to be capable
ting is said to animate the oxen somewhat in the same
s that are so prevalent in the same county. Certainly
with an agility that would be scarcely expected from
ay be watched a long while without one harsh word
ad or the whip applied. The opponents of ox-
the valleys of north or south Devon, to see what
of performing, and how he performs it.

om the use of oxen in this district arises from the
are trained, and which is unknown in any other part
ing harvest time, and in catching weather, they are
g with the empty waggons, at the rate of six miles
peed which no other ox but the Devon has been able

lar to the traveller, that in some of the districts that
e very head-quarters of the Devon cattle, they are
ough. The explanation, however, is plain enough.
among graziers is so great, that the breeders obtain
or them at an earlier age than that at which they
a for the plough.

fullest
stinted
dispose
for and
The
them h
but, in
food,
charac
factory

Mr.
Bedfo
prime
and h
latter
dition
per he
when
ness ar
A m
oxen w
1798,

1 Here
2 Do.
3 Devo
4 Do.
5 Susse
6 Leice

An e
tening
Januar

We a
ent res
Egrema

fullest size. If he is kept idle until he is five or six, he will invariably be stunted in his growth. At six he reaches his full stature, unless he is disposed to be of more than ordinary size, and then he continues to grow for another half-year.

Their next quality is their disposition to fatten, and very few of them here. They do not, indeed, attain the great weight of some of the other breeds, but, in a given time, they acquire more flesh, and with less consumption of food, and their flesh is beautiful in its kind. It is of that mottled, speckled character so pleasing to the eye, and to the taste. Some very satisfactory experiments have been made on this point.

Mr. Carpenter, a very intelligent farmer, informs us, that the late Mr. Bedford, who has considerable property in the county of Devon, had a prime Hereford oxen sent to his Tavistock estate in the month of October, and he ordered some Devons to be bought in Crediton market at the latter end of the same month. The Devons were not in so good condition as the Herefords when they were put to grass, and cost a guinea per head less than the Herefords; but at the latter end of December, when they were all sold to the butcher, the Devons were superior in condition and in weight.

A more satisfactory experiment was made by the same nobleman. Sixteen oxen were selected in November 16, 1797, and fed until December 1, 1798, and the following was the result.

	First weight.			Second weight.			Gained.			Zoor oil cake.	
	cwt.	qrs.	lbs.	cwt.	qrs.	lbs.	cwt.	qrs.	lbs.	or stone.	lbs.
1 Hereford .	17	0	1	18	3	0	1	2	27	24.3	27
2 Do. .	18	1	0	21	0	25	2	3	25	41.5	27
3 Devon .	14	1	7	17	2	7	3	1	0	45.4	26
4 Do. .	14	2	4	19	1	0	4	2	14	64.6	20
5 Sussex .	16	2	0	19	3	0	3	1	0	45.4	26
6 Leicester .	15	2	14	18	2	0	2	3	14	40.2	26

An experiment of the same nature was made, in order to compare the fattening properties of the Glamorgan with the Devon. They were fed from January 6, to December 1, 1804, and the following was the result.

	First weight.			Second weight.			Gain.			
	cwt.	qrs.	lbs.	cwt.	qrs.	lbs.	wt.	qrs.	lbs.	or stone,
1 Devon .	13	1	7	17	3	7	4	2	0	63
2 Do. .	16	0	10	20	3	14	4	3	2	67
3 Glamorgan .	13	3	0	16	0	14	3	3	18	54.6

We are aware that other experiments have been instituted, and with different results. One was made about the same time at Petworth, by the Duke of Egremont. Eight oxen consisting of three Herefords, three of the

the dairy.

pt Hall, near Epping, a district almost exclusively
oses of the dairy, preferred the North Devons
large produce, whether in milk, butter, or by
t that they held their milk longer than any other
; that they were liable to fewer disorders in their
ng of small size, they did not eat more than half
sumed. He thus sums up his account of them :
en cows give me five dozen pounds of butter per
nd two dozen in the winter. A good North Devon
year. My thirty North Devon cows have this year
average produced a profit of 13*l.* 14*s.* per cow.'

ary surgeon at Exeter, and to whom we are in-
le hints, says that the quality of the milk is good,
erating to the dairyman. Such is not, however, the
ey are kept principally for their other good qualities,
e breed ; and because, as nurses, they are indeed
ves thrive from their small quantity of milk, more
sibly be expected.

d of British cattle is a very valuable one, and seems
ighest point of perfection of which it is capable.
s thirty years ago, yet fully as active. Its aptitude

prejudice will mislead the best judges, we have a remarkable
t zealous patrons of the short horns in Worcestershire, who
hire cattle in the Farmer's Magazine, February, 1827. 'Of
vons I had an opportunity to form a tolerably correct opinion
he best possible muster of Devonshire oxen is made. I saw
among them. With the exception of this animal, I did not
want of beef in the roasting parts, low and poor loins, coarse
general want of the indications of inside proof.'

n after it was killed, and he says, 'I never beheld a worse
stances. The meat was actually running about the stall,
mixture of flabby masses, deficient of firmness of texture and

r's Magazine,' Mr. Herbert, thus describes the Devonshire ox :
ng many horses, healthy and hardy, and fattening even in a
will stand many a dead pull, fat in half the time of a Sussex,
s of any other breed, lighter than the Sussex ; but not so well
ong the tops of his ribs, a sparkling cutter, and lean well in-

ed, starred, or white faced, better horned than the ox, very
children, a sure breeder, a good milker, a quick fattener, fair
hs. The ox from 110 to 130 stone, and has been fed to 170 ;

which
at le
patro
wha
almo
opin
disea
king
catti
cold
shir
muc
M
the
the
the
grazi
nativ
was
Devo
after
man
M
the
size
refer
light
adds,
you
a De
of the
again
to cr
work
Th
Devo
wards
addit
to suc
and w

which, within a month from the period of losing their milk, would at least ten score per quarter. The Duke of Somerset is a patron and improver of the breed, and has some beautiful cattle. Whatever may be the case at Woburn, the Duke of Bedford has almost exclusive preference to the Devons. When offering his opinion, that the Devonshire cattle are more than usually free from disease, Mr. Rogers gives a hint that may be useful in every district in the kingdom. He attributes, and very truly, the greater part of the mortality of the cattle, and all those of the respiratory system, to injudicious exposure to cold and wet; and he asks whether the height and thickness of the Devonshire fences, as affording a comfortable shelter to the cattle, may have much to do with this exemption from disease?

Mr. Roberts, veterinary surgeon at South Molton, informs me that the North Devons have been crossed with the Guernsey breed, the consequence has been, that they have been rendered more valuable for the dairy; but they have been so much injured for the plough, and for the grazier, that the breeders are jealous to preserve the old stock of native purity. Mr. Roberts speaks of a gentleman of South Molton who was very tenacious in preserving unsullied a breed of first-rate Devons, and who refused fifty guineas for a cow in calf. He sold her afterwards, for 32*l.*, when she was thirteen years old. When this man sold off his stock, twelve cows fetched on an average 30*l.* each.

Mr. Carpenter, to whom we have already alluded, says, that 'one of the advantages of the North Devon with the Hereford is of advantage, as we have a size and aptitude to fatten without losing activity.' We apprehend he refers to the state of these cattle some years ago, and when they were lighter, rather than to the present improved breed; but he very justly adds, 'it must be one cross alone,—you must not exceed the first cross, or you destroy the activity in labour, which is the principal source of profit to a Devonshire farmer.' He adds, 'never introduce heifers; but go on with the very best blood, and after the first cross, return to the best Devon again, and continue until the white face is nearly extinct before you cross a second time. The Durhams have been tried, but they do not work, and are too much loaded with coarse plain meat in the fore-quarters.'

The treatment of the calf is nearly the same in every district of Devon. The calves that are dropped at Michaelmas, and some time afterwards, are preferred to those that come in February, notwithstanding the additional trouble and expense during the winter. The calf is permitted to suck three times every day for a week. It is then used to the pail, and warm new milk is given it for three weeks longer. For two

country which extends from Tavistock to Newton the South Devons in full perfection. They are Devons with the native breed of the country ; and so be to the soil, that all attempts to improve them, so long go, have utterly failed. They are often 14 cwt. and steers of $2\frac{1}{2}$ cwt. are got with fair hay and grass one cwt. They bear considerable resemblance to sometimes the colour and the horn and the white in both, that it is difficult to distinguish between are usually smaller than the Herefords.

of the country in which there is such bad management of the preservation of the breed as in this and the Devon. It is not properly a grazing district except Tavistock ; but young cattle are rather brought up on turnips elsewhere than finished here for the market in which this is conducted is not to be commended. When a calf is put to the cow, it is suffered to run with the cow ten or twelve months. If others that had not before shown a distaste for the cow, they are forwarded as quickly as may be, and when it is, that all those that are retained, and by which the breed is kept up, are the very refuse of the farm. Yet the breed is not so much neglected. It has found a congenial climate, and it will not suffer from neglect and injury. *The grand secret of breeding is in the soil and climate.* It is because this has not been attended to in districts which have been invaluable in certain districts, and is now so profitless, and unworthy of culture in others. The breed is not so profitable for the grazier, the breeder, and the butcher as that of the North Devons. It is not so delicate as that of the North Devons. It is not so fit for the service of the navy ; but they will not suit the fastidious inhabitants of Bath, and the metropolis.

of the principal cattle fairs in Devonshire, and principally for the Devon breed, is extracted from the Annals of Agriculture :— This breed at fairs, will find them first at Ashbrittle, a bordering town (Devonshire and Somerset), held for oxen on the 25th of March, terminate as to prices. Bishops Lydiard, five miles to the north of March, for oxen also. At this and Wellington, which is near Ashbrittle, prices of stock are fully ascertained. Barnstaple, the 1st of April. The great monthly markets of Taunton, Wiveliscomb, and Wellington on the business till the fairs of Crediton, the 11th of May. Crediton, the 13th. North Moulton, first Wednesday. Bampton, Whit-Tuesday ; and South Moulton, Wednesday

cows, and such as are found scattered over Cornwall, West Devon, Somerset, and part of Dorset.

As we advance along the south and the east, to Teignmouth, Exeter, Sidmouth, and over the hill to the fruitful vale of Honiton, we find oxen so much used in husbandry. The soil is either a clay, or its flints would speedily destroy the feet of the oxen. A variety of pure North and South Devons, and natives of that district, with intermixtures of every breed prevail, but the South Devons are principally seen. Some of these cows seem to unite the qualities of fattening and milking. A south Devon has been known, after calving, to yield more than two pounds of butter a day; and some of the old southern native breed are equal to any short horn in quantity of their milk, and far superior to them in its quality.

I must not quit this part of the country without describing the method of making *cream*, which is peculiar to the west of England. The milk is put to stand in a bell-metal vessel four and twenty hours; it is then placed over a small wood fire, so that the heat shall be very gradually communicated to it. After it has been over the fire about an hour and a half, and is approaching to the state of *simmering*, the vessel is struck now and then with the knuckle, or is very carefully watched, as it ceases to ring, or the first bubble appears, a slight agitation, or *simmering*, previous to boiling, has commenced; and the secret preparation is that this *simmering* shall not proceed to boiling. The vessel is immediately removed from the fire, and set by for twenty-four hours more. At the end of this time all the cream will have arisen, and is thick enough to cut with a knife. It is then carefully skimmed off, and is a great luxury with coffee or with tarts, and the Devonshire cream, berries and cream need no praise.

The dairy people in these districts say, that it is the most proper way of treating the milk; that five pounds of butter can be obtained from a given quantity, where only four would be yielded by the common method; and that the butter is more saleable, on account of the pleasant taste it has acquired, and which even its occasional slight smoking scarcely impairs. The milk is proportionably impoverished; but it has gained a taste which renders it more grateful to the pigs; they never scour them, but removes the diarrhœa produced by other methods. The skim-milk cheese must, however, be abandoned, or if made, it is exceedingly poor and tasteless.

and great numbers of cattle, yet in a few centuries
ected, and all their skill and industry were exerted
s that speak the county's sterling praise.'

of Cornwall, says, that 'the people devoting them-
their neighbours in Devonshire and Somersetshire
a rent, and stored them with the cattle which they
homes, and made their profits of the Cornish by
poors. The same persons also supplied them at their
dred quarters of corn and horse-loads of bread.'

are has, however, within the last century or two,
this extreme western portion of the kingdom.

Cornwall is still to be found on some of the moors
the county, and in the possession of many of the
small, black, with horns rather short, very coarsely
s, and rarely weighing more than three or four
bear an evident resemblance to the native breeds

They are very hardy, and calculated to endure the
of this peninsular and unevenly-surfaced county.

and unimproved, this is far from being a bad
re fair milkers; their thick hides keep out the cold
them from many diseases; they range on the
ounds, and commons in the summer, at little or
winter are satisfied with heath and furze, and a
; and when put upon better keep, they get fat with
ble.

and a better breed is an evident cross between the
indigenous one of the county. It is somewhat
l head, and more upright horns, resembling, in the
are turned, those of the wild cattle of Chillingham
e those of the Devons, are thin, rapidly narrowing
ls the head. Their chests are deep, but rather
little longer than in some other favourite breeds.

deep and full. They get fat in their points, but
r sides, and are thin in their belly-pieces; they
and their hides are thin and unprofitable. They
ng character of the North Devon,—they have the
t, bright dun muzzle, and ring about the eye.

ornwall, however, the extreme Western districts
th Devons are found equal to any their native
Many spirited farmers go to Barnstaple, or South

with cor
milk wi

The
appears
between
ment, f
the but
Cornis
better

The
About
fields
go into
fed on
bruary
market

The
and ma
and aft
great d
farmers
older b
called

Arth
still pu
between
days or
of three
and mi
own fan
gruel.

the salt
quart o
now pl
after th
quantity
When t
a consid
In some
months,
that pur

with considerable success, and uniting the rare qualities of abundant milk with aptitude to fatten.

The Durham breed has lately been introduced by Mr. Peter appears to have succeeded well in a few grazing districts. A cross between the Devon cow and the Durham bull is an evident improvement, for the animal thus produced is profitable both for the dairy and the butcher. It must, however, be confessed, that the majority of Cornish farmers are partial to the North Devons, and they appear better adapted to the soil of this county than any other breed.

There is no particular management of the dairy cow in Cornwall. About November, the cows are turned for the winter into *crofts*, or small fields that have been kept up for them. In the spring and summer they go into larger or uninclosed ground. The fattening beasts are generally fed on turnips in the winter; and many of them are turned out from February to June for the home consumption of Devonport and Plymouth markets.

The Cornish land is not usually very rich, but the farmer is industrious and manages well. In many places the sod is pared and burned for fuel, and after wheat come turnips, which produce much winter food, and a great deal of dung, yet not in sufficient quantity for the stock. Farmers are generally compelled to give their young stock, and even older beasts, a great deal of straw. Sea-sand and sea-weed are also called into requisition for manure, and are found to be exceedingly beneficial.

Arthur Young describes the method of rearing their calves which is still pursued in a great part of the county. They are taken from their mothers between the fourth and sixth day. Raw milk is then given to them for three days or a fortnight, and afterwards scalded milk and gruel, in the quantity of three or four quarts in the morning and at night. A mixture of malt and milk is found to be better than scalded milk alone. Some give them their own family-broth, which is thought to be as good as, or better than, the gruel. The calves are fond of it, and thrive upon it; and the flavoured salted provisions increases the appetite, and promotes digestion. A quart of broth or gruel is added to two quarts of milk. A little fine sugar is now placed before them, which they soon begin to eat. For a little time after they are turned to grass, this food is continued, according to the quantity of milk in hand, or the goodness and quality of the pasture. When they are ten or fourteen weeks old, they need no more milk. A considerable time before this, the quantity is reduced to less than a quart. In some parts, the calves are, during the winter and after the two months, reared solely on hay and turnips, the turnips being sliced for that purpose. Many of the best breeders place two calves to one

on; and it was formerly worked by four oxen, with
e them. This practice is now considerably on the
ce has proved, that both oxen and horses are best
es. Oxen are also employed in *butts* and *wains*,
d of rude cart or waggon, and well adapted for the
w them, and the roads they are to travel.

to the yoke at three years old, and worked until they

They are as active as any horses; and, like the
mulated much more by the pleasing chaunt of the
he goad. They are shod, and *brakes* are generally

ever, the use of oxen in husbandry is getting out of
iety and economy of this will be discussed in the
en are not now generally seen even in the plough,
are very rarely employed.

consumption, few cattle are fattened in Cornwall,
are usually sent to Somersetshire, or other grazing

DORSETSHIRE.

ox'—but whether it is the indigenous breed of the
f doubt,—has long horns. Some assert, and with an
bility, that the true Dorset was a middle horn, some-
South Devon, but not so large, and that the long
on from the northern or midland counties, or a mix-
hire, the Wiltshire, and perhaps the Oxfordshire
rned breed, a rough sort of cattle, and far from
so many years established in various parts of the
arded by some as the original one. These have been
von bull, and evidently with advantage: they are
and fatten quickly. They are principally found in
ern divisions of the county. Towards the west, a
n and the Dorset prevails, and many farmers culti-
ns. The climate, however, does not appear to suit
they do not here grow to any great size; and some
are even worse milkers than in their native district,
s diseases, and particularly to diarrhœa. Mr. Nobbs,
edly of this opinion.

Devon and the Dorset is an improvement on both.
a still better kind of cattle by crossing again with the
s are, with every probability of success, engrafting

In the
vailing b
that is re
or size.
Blackmo
poses of
made her
Dorset
when ke
it is, ho
quantity
A gr
of the
being g
pose to
Much
Spooner,

The M
borders
and Ilch
of Some
and eve
the De
fatten, t
better m
the soil
count th
Taunton
the grea
Barnsta
for the
have no
material
Mr. Ca
in the V
south-we
that wi
difficult
highest

In the Dorset dairies, there can scarcely be said to be a decided prevailing breed. If the heifer is likely to make a good milker, that is regarded, and little or no attention is paid to the shape, or colour or size. About a fifth part of Dorsetshire is occupied by the vale of Blackmoor, a very rich pastoral country, and well adapted for the purposes of the dairy. A considerable quantity of butter and cheese is made here. On those farms where most butter is made, the Dorset cheese is manufactured from the skimmed milk alone, and when kept until it becomes "blue-vinney'd," is very much appreciated; it is, however, more celebrated in than out of the country. A large quantity of butter, both in its fresh and salted state, is sent to London.

A great many calves are sent from the Vale of Blackmoor in the spring of the year to Poole, and there shipped for Portsmouth; and the supply being greater than the demand, the butchers find it answer their purpose to forward much of it to the London market.

Much of this concise account of Dorsetshire we owe to Mr. Spooner, veterinary surgeon at Blandford.

SOMERSETSHIRE.

The North Devon cattle prevail along that part of the county borders on Devon until we arrive in the neighbourhood of Wincaster and Ilchester, where the pure breed is almost lost sight of. In the south of Somerset few of the Devons are to be seen; but along the coast, and even extending as far as Bristol and Bath, the purest breed of the Devons are preferred. They are valued for their aptitude to fatten, their quickness and honesty at work; and they are said to be better milkers than in their native county. They are of a larger size where the soil is better, and the pasturage more luxuriant. It is on this account that the oxen bred in some parts, and particularly in the Vale of Taunton, although essentially Devons, are preferred to those of the greater part of Devonshire, and even from the neighbourhood of Barnstaple and South Molton. They are better for the grazier and for the dairy; and, if they are not quite so active as their progenitors, have not lost their docility and freeness at work, and they have gained materially in strength.

Mr. Carpenter, to whom we have already referred, and who is now resident in the Vale of Taunton, informs us that the farmers in the south-west of Somerset are endeavouring to breed that sort of cattle that will answer for the pail, and the plough, and grazing,—a difficult point, as he acknowledges, to hit; for those that are the *highest proof* (exhibiting those points or conformations of particular

the short horns, however, are very different from those
where else. They resemble neither the old nor the im-
East York, but were originally made up of a mixture of
old Somersetshire cow.

ire cattle are thus described by Mr. Herbert, as they
enty years ago; but we can scarcely believe the account
Somersetshire formerly had a breed of cattle which,
form of its turned-up horn, seemed to be between the
riginal short-horn (he must mean the middle horn,
is of foreign extraction); useful and heavy; high
ularly behind. It was used for the supply of the ship-
Salisbury market, and thence forwarded to Portsmouth.
d milkers, and fattened kindly.

f them from what the West Somersets are now, they were
They betray their Devonshire origin; but in the opinion
re farmers, they are far preferable to the native breed,
eased in size without losing any of their useful proper-
better judges than these Somersetshire men; for being
l between the breeder on the one side, and the grazier
aving opportunity daily to observe the failures or the
ey acquire a kind of intuitive knowledge of the points

resent West Somerset cattle are characterised by a
r. They are called *sheeted* oxen. The head, the neck,
the hind parts appear as if they were uncovered, while
ly and perfectly thrown over the barrel. They do not,
e true Devon colour in these uncovered parts, for the
ead of a deep blood red, or almost brown colour.

set few of the Devons are to be seen, but they are the
d kind of which I have just spoken.

in his Survey of Somerset, says, that in this district,
h and Frome on the east, to Uphill and Kingsroad on
are mostly short horns, with some fine long horns from
eifer of three years old that discovers any disposition to
t of the dairy, because experience has convinced the
seldom or never prove a good milker; and the breeders
en obliged to have recourse to Welsh nurses, because
y of milk in the parent animal.

Somersetshire, from the Mendip hills on the north, to
e West, and Chard on the south (principally a grazing
hat the business is divided into a summer and winter

math from
added by
the Salis
to Lady-
benefit o
months g
tiful in th
from four
Some
April, a
rate of
fatted a
Some
year pay
less food
The ti
farmers t
or a mon
to the go
is frequ
reared in
sold in S
buy and
Tuesday
The o
turned o
part of t
of butter
about thr
the pail a
These ca
of three
quarter.
made w
business
the chee
wife then
forces a
little mil
good cal
pigs, they

math from the beginning of September to the end of November ; hay added by degrees, until it is required entirely. These oxen are so the Salisbury or London markets, either before Christmas, or from to Lady-day. A dairy farmer seldom grazes, except an old cow for benefit of his neighbours ; and these seldom get more than four months grazing after they are dried up. Beef of this description is as tiful in the autumn as veal in the summer, and about the same price (1 from fourpence to fivepence per pound.

Some farmers graze heifers in preference to oxen, buying in March or April, and selling in October or November ; and which are stocked at a rate of a heifer to each aere, with one or two sheep. The sheep fattened are usually the two year old Dorsets or Somersets.

Some give their prime oxen a second summer grass ; and the second year pays better than the first, for an animal nearly fat will consume less food than a lean one.

The time of calving is from the beginning of February to Lady-day. Farmers take great care to keep their cows in good condition for three weeks or a month before they calve, thinking that the milk will flow in proportion to the goodness of the keep at that time ; and the consequence of this is frequent attacks of puerperal fever and garget. The number of calves reared in this district is very great. Four hundred fat calves have been sold in Shepton-Mallet market in one day, but now the village butchers buy and slaughter them at home, and take the carcasses to Bristol for Tuesday and Saturday markets.

The calves that are reared are principally fed on cheese-whey, and are turned out to grass in May to shift for themselves. In the southern part of this district, where the dairy-lands are chiefly applied to the making of butter and skim-milk cheese, the calves are taken from their mothers about three days old. Those that are to be fattened are suckled by hand from the pail as soon as it is brought home from the field morning and evening. These calves are technically said to be *on the stage*. It will take the milk of three cows to fatten two calves up to from thirty-five to fifty pounds a quarter. The old practice of giving the calves mead or some other home-made wine is now discontinued. Soon after Lady-day, when the busy business of cheese-making begins in good earnest, the milk is wanted for the cheese-vat instead of the suckling-pail. To fatten the calf, the farmer's wife then places the whey over the fire in a large copper, and the water forces a further portion of poorer curd (*skim curds*), and these, with a little milk, and with the occasional addition of lintseed-meal, make a good calf. The calves to be reared are thought to be well off, if, like pigs, they get whey.

portion in a dairy of forty cows is about twenty-spotted, and five with a white face; and yet, as the been rarely if at all tried in this district, the white by the farmer as of Herefordshire origin. A Durham reed from Warwickshire, was lately slaughtered here, and 13 lbs. per quarter. It was fed by Mr. Burman, of

prime Cheddar cheese is made at that village. It is d in the parishes just mentioned, and in the marshes

A somewhat inferior Cheddar is often sold as *double* he Vale of Berkeley, the cows are pastured and milked se, and the milk set with the rennet as soon as possible, d for two hours. The curd is then broken; a por- st warmed and put to it, and then the whole of the hot, and poured upon it, and left for half an hour. The ut into the vat, and the other processes conducted much This scalding is supposed to favour an intimate union e whey, and likewise to dispose the oleaginous matter give the cheese that soft, rich, fatty appearance and is distinguished.

mends the addition of one Guernsey to every dozen thinks that this quantity of rich milk being added might ow a greater weight of curd. It certainly is so when and that small quantity would not injure the keeping. mixed is too rich and will not keep, and so it might

e dairymen usually keep their cows until they are ten and then turn them off for failing, not in the quantity he milk. At this time they are reduced to half the ed cow of the same age; but if it should appear, as at the short-horn will make a half-hundred of cheese than the long-horned Wilts, and at the same time cost e balance will be found to be in favour of the short or erset. In the upper part of the country, and where l, the graziers go into North Wilts and Hampshire to f the best of them are nearly equal to the Devons, but not so *high in proof*. Occasionally they are brought re, and even from Yorkshire, and are now and then thirty-eight or forty score pounds each.

are fattened in Somersetshire, on account of the cheap re purchased when lean

in the le
in the c
fat; the
coarser.
to the D
Mr. M
but does
counter
lively;
long an
shoulde
mellow
with th
level of
quarter
carcase
close on
large an
thigh cl
the kne
where
chine, t
ness, an
silky;
Herefo
The
fifty to
fifty sco
seventy
and ten
their fo
honesty
vity.
therefo
that he
employ
Downto
connect
we shal
They
acknow

in the leg; and also in the carcase; higher, and broader, and in the chine; rounder and wider across the hips, and better covered with fat; the thigh fuller and more muscular, and the shoulders larger and coarser. The cut in the following page, is the portrait of an ox belonging to the Duke of Bedford.

Mr. Marshall gives the following account of them: it is tolerably correct but does not sufficiently distinguish them from their kindred breed. Their countenance pleasant, cheerful, open; the forehead broad; eye full and lively; horns bright, taper, and spreading; head small; chap lean and long and tapering; chest deep; bosom broad, and projecting forward; shoulder-bone thin, flat, no way protuberant in bone (?), but full and mellow in flesh; chest full; loin broad; hips standing wide, and level with the chine; quarters long, and wide at the neck; rump even with the level of the back, and not drooping, nor standing high and sharp above the quarters; tail slender and neatly haired; barrel round and roomy; carcase throughout deep and well spread; ribs broad, standing close on the outer surface, forming a smooth, even barrel, the hind ribs large and full of length; round bone small, snug, and not prominent; thigh clean, and regularly tapering; legs upright and short; bone of the knee and hock small; feet of middle size; flank large; flesh everywhere mellow, soft, and yielding pleasantly to the touch, especially in the chine, the shoulder, and the ribs; hide mellow, supple, of a middle thickness, and loose on the neck and huckle; coat neatly haired, bright and silky; colour, a middle red, with a bald face characteristic of the Herefordshire breed.

They fatten to a much greater weight than the Devons, and run from fifty to seventy score. A tolerable cow will average from thirty-five to fifty score. A cow belonging to the Duke of Bedford weighed more than seventy score; and an ox belonging to Mr. Westcar exceeded one hundred and ten score. They are not now much used for husbandry, although their form adapts them for the heavier work; and they have the honesty and docility of the Devon ox, and greater strength, if not high speed. The Herefordshire ox fattens speedily at a very early age, and is therefore more advantageous to the farmer, and perhaps to the country, than that he should go to market at three years old, than be kept longer and employed as a beast of draught. We are indebted to Mr. A. Knight, of Downton Castle, for some valuable observations on this and other subjects connected with the Herefordshire cattle, and breeding in general, of which we shall avail ourselves in the proper place.

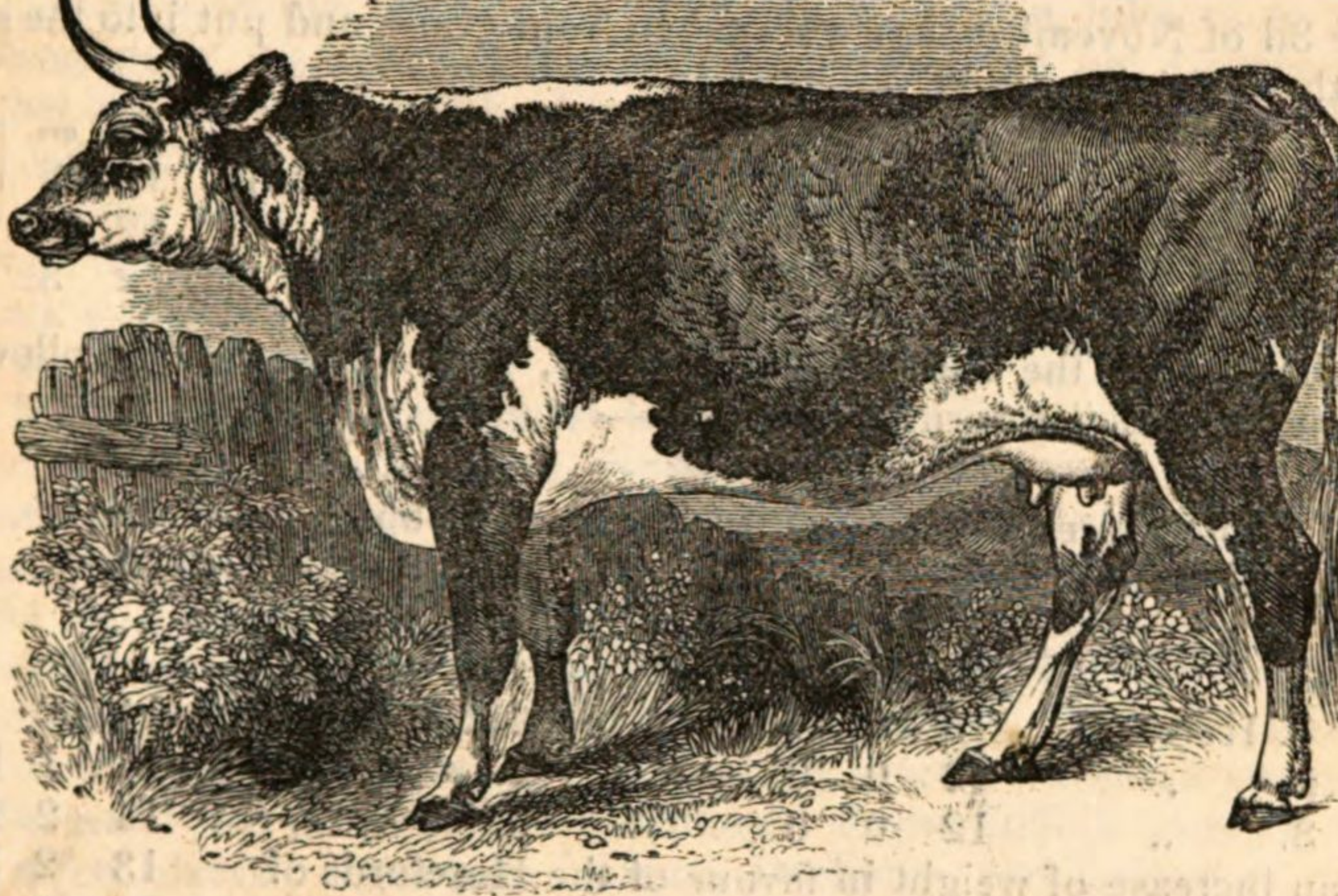
They are far worse milkers than the Devons. This is so generally acknowledged, that while there are many dairies of Devon cows in vogue

ord, and they had the defect of being extremely pug-
gh an excellent judge of cattle, formed a very erro-
e Herefords when he pronounced them to be nothing
Welsh with a bastard race of long-horns. They are
nal breed, and descended from the same stock as the
e not for the white face, and somewhat larger head
would not at all times be easy to distinguish between
a light Hereford. Their white faces may probably be
h their not distant relations, the Montgomeries.



is apparently a very inferior animal. Not only is she
he form has been sacrificed by the breeder. Here-
earing than a feeding county, and therefore the farmer
shape and value of his young stock; and in the choice
not value her or select her, or breed from her according
ties, or the price which the grazier would give for her,
as she possesses that general form which experience
render her likely to produce a good ox. Hence the
mparatively small and delicate, and some would call
is very light-fleshed when in common condition, and
she is breeding, she is not suffered to proceed; but

King
country
cipally
in tole
of Bu
princip
The
The tr
luxuria
pasture
and the
ing-sto
has pr
and ev
quantit
A ve
Herefo
mode o
he res
aering



[*The Herefordshire Cow.*]

Kindly as the Hereford ox fattens, very few are grazed in their country: even the beasts which the home consumption requires are principally heifers and old cows. The oxen are sold at five and six years in tolerable condition, at the Michaelmas fair in Hereford, to the gentlemen of Buckinghamshire and the neighbouring counties, by whom they are principally preferred for the London market.

The fertility of the soil in Herefordshire has been very much overrated. The traveller, and the superficial observer, have been misled by the luxuriant woods and rich alluvial soil upon the banks of its rivers. The pasture-grounds are generally poor, and the herbage is not nutritious, and therefore the farmer naturally confines his chief attention to his breeding-stock. The Dairy has been comparatively neglected; for experience has proved that the breeding qualities of a cow are materially lessened, and even her form is deteriorated, by her being inclined to give a large quantity of milk.

A very interesting trial was made in the winter of 1828-29, between the Herefords and the improved short-horned breeds of cattle, in the ordinary mode of feeding, without forcing by artificial food of any description. The result seemed to be much to the advantage of the Herefords, in maintaining their original weight, and the quantity of food consumed. It

September they were taken from grass, and put into the stall
it was as follows :—

	Cwt.	qrs.	lbs		Cwt.	qrs.	lbs.
rd	11	3	0	No. 1. Short-horn	12	3	14
	10	2	0	2. „	12	2	0
	10	3	0	3. „	12	3	0

On the 25th of March, 1829, they consumed the following
dish turnips and hay :—

	Turnips lbs.	lbs.
Herefords	46,655	5065
Short-horns	59,430	6779

and—

rd	13	0	14	No. 1. Short-horn	14	2	0
	12	0	0	2. „	14	1	14
	12	0	0	3. „	14	2	14
of weight in favour of the Herefords of					13	2	14
the Short-horns					17	2	0
Difference in favour of the Short-horns of					3	3	14

Short-horns had consumed 12,775lbs. more of turnips, and
hay.

They were all sold together at Smithfield on the 30th of March,
Short-horns fetched 97*l.*, and the lighter Herefords 96*l.*, being
only 1*l.* to pay for the enormous difference in the food con-
siderable price given on account of the heavier weight of the
at commencement of the experiment*. Another Hereford
were also tried together at the same time; but they did
same process, nor was so regular an account kept of their
Hereford increased in weight 3 cwt. 3 qrs., and the short-

cattle fair at Hereford is not exceeded by any show of beasts in
kingdom. They are usually sold to the graziers in the neighbour-
hood, by whom they are prepared for the Smithfield market.

From an account book kept by William Town, in the neighbourhood of
1694, of the price of fat oxen at that period.

1744,—sold the nine oxen at 52*l.*; the money to be paid into the
month." The price of oxen is, at least, six times as great now.

Glamorgan chiefly, but upon a larger scale, and of a different colour. Glamorgans are black, or inclining to brown; the old Gloucesters are either red or brown. The horns were of a middle length, well tipped with black; the bones small, and the carcase light, averaging more than twelve score per quarter. The bag was large, and the milk abundant and long continued. The characteristic mark was said to be a streak of white generally along the back, and at the root of the tail.

Many years ago the farmers began to cross them with the long-horn, and principally those from North Wilts. Thence arose considerable increase of size, with more tendency to fatten, and richer and less abundant milk. This breed is principally found in the district of Gloucester, about the Cotswolds. Some farmers, indeed, crossed so frequently with the long-horn, that little of the old Gloucester remains, and not a few use the long-horns alone. The prevailing breed, however, about the hills, and particularly among the small farmers, is the Gloucester and the Wiltshire combined. Some Suffolk duns are kept in a few places; some pure Devons, Durhams, and Leicesters are also found, but chiefly a mixture from among them all, the Gloucesters and the Wilts preponderating, while each farmer breeds and chooses according to his pleasure or caprice.

In the hilly part of the county cattle are an inferior object of cultivation; there is little peculiar in the management of them; and even the best does not deserve commendation. The principal purpose for which they are here kept is to pasture on those spots which are unsound for any other purpose. A great proportion of many of the farms in this poor district can be made profitable by turning young stock upon them; which, however, they never thoroughly fattened there, but the young stock, and the ewes, even the sheep, are sold to graziers from the neighbouring districts in tolerable store condition. The early-dropped calves are chosen for sale; the others might not have sufficient strength to endure the winter, and are speedily got rid of.

The calves that are to be reared continue two or three days with their mother, sucking as they like, and taking the milk that is good for themselves. They are then fed with skim-milk a little warmed, being first rubbed with the finger; but they soon drink eagerly out of the pail. Linseed cake is after a little while mixed with the milk; afterwards the milk is mixed with oat or barley meal, and so they are brought to solid food, and weaned.

When the grass begins to fail in November, they are fed in the barn, where there is some tolerable shelter for them; and the yearling calves are

D

much improvement here, as well as in many other
dom in the management of live stock.
ale part of the county, where cattle are kept principally
ot to feed on the unsound and rotting ground, a more
profitable system of management is adopted.
erkeley, as the long and rich tract of land is called
e Cotswolds to the Severn, the cows are, as in the
ious sorts and kinds. In all of them, however, traces
ster are visible, and carefully preserved. The cross
ancy of the dairyman. Some have mingled the Alder-
ester, and they have both increased the quantity and
milk; others have mixed the Wilts and the Gloucester,
supply of excellent milk; while some have introduced
eby they have certainly added to the quantity, although
riorated the quality of the milk: but the majority, and
sly, have mingled all these together, and they have
d both the quantity and the quality. There are no
ail; a few Devons, some Suffolks, some North Wilts,
sters, with various crosses.

the Gloucester and the Hereford has been attempted
uccess. They yield from four to six gallons of good
t is difficult to account for the fact that, while in
e large and small farmers agree in selecting a certain
o that selection, almost every dairy district is charac-
assemblage of all sorts and kinds of cattle. We shall
to allude to this.

ted dairy country. From the Vale of Berkeley is pro-
of the cheese, which is known in every part of the
names of the single and double Gloucester.

of the peculiar management of this district must now
our work perfect; but for a more detailed account, the
o the Twenty-first Number of the Farmer's Series, in
management both of the Gloucestershire hill and vale
bed.

n with the mothers about a week. They are then fed
st, by means of the feeder's fingers introduced into
ch being supplied with milk, are sucked by the calves;
of themselves. Linseed tea is, after a little while,
; and soon after that the milk is quite withdrawn, and
tirred with the linseed, until the calf is able to eat hay
middle of May they are turned out to good grass, and

pastu
the m
much
there
It
is no
rich.
two
Whi
on th
mar
dair
with
T
Exp
the g
than
As
situa
to re
plent
have
howe
econ
calf,
The
refo
Th
a pe
to wh
is to
the ef
Th
that
ming
good
which
The f
and s
little a
by the
cooled

pasture to pasture. This is a method of rendering them productive, the majority of farmers are not aware. At the same time the farm is much understocked as a hill-farm is too frequently overstocked, there is plenty of good keep for every cow.

It has been found that land, which has been lately and much enriched, is not so good for the cows. The milk may be more abundant, but is not so rich. Dr. Rudge, in his Survey of Gloucestershire, says, that on two grounds adjoining each other alternately used for the pasture. While they were on one, excellent cheese was made; but when they were on the other, the cheese was rank, heaving, and hollow, and unfit for market. The latter had been lately well-dressed with manure. A dairywoman remarked that, if the farmer continued to enrich the land with dung, she must give up making cheese.

The cows are early moved from the pasture-ground into the arable ground. Experience has taught the farmer that few things are more conducive to the general health of the animal, as well as the abundant supply of milk, than the first flush of grass in the spring, or after mowing.

As the winter comes on, they are moved into the driest and best situations. It would be advantageous if there was some shed for them to retreat to as a protection from the extreme cold; and they should have plenty of good hay allowed them once or twice in the day, both before and after they have calved, and several times in the day afterwards. In some parts, however, although not by the generality of farmers, the system of wintering is prevalent in the hilly district is adopted here, and the cows, calf, and the young and store beasts, are half-starved during the winter. There is no part of dairy and cattle management which more needs reformation than this.

The principal product of the Vale of Berkeley is its cheese, which has a peculiar flavour, and is deservedly esteemed. It is not quite clear to what peculiar circumstance the excellence of the Gloucester cheese is to be attributed; for several things, probably, combine to produce the effect.

The breed of the cow has little or nothing to do with it. We have that almost every variety of breed is found here, and the milk of all is mingled together. The cows are taken better care of. The pasture is good, and it is old, and is composed of the natural grasses of the country, which are grown here with little admixture of foreign or artificial grass. The fields, another circumstance not sufficiently appreciated, are well watered and surround as much as possible the farm-houses, so that the milk is not so little agitated, or the component parts of it separated before it is set by the rennet. By this means, too, the milk may be set, before it is cooled below the proper temperature.

may be attributed to a less degree of squeezing with the hand in the curd, when a great deal of the fatty matter of the cheese is pressed out, the knife being more used than the hand in dividing.

The principal characteristics of the Gloucester cheese are its smooth and oily texture instead of breaking when cut, retaining fatty matter so perfectly in the operation of toasting.

We have already related the manner in which *Cheddar cheese* resembles the *double Gloucester*.

A little before Michaelmas the cheese is submitted to the factotum, who often adopts a very summary way of examining it. He treads upon the cheese, and those which yield to the tread he condemns as "heaved," "hoved," and are kept for home, or, at least, for country consumption. Many causes have been assigned for this "heaving." Some attribute it to the pasture. It is said to have been too luxuriant, or to have had too many early plants in it. The dairymaid always stoutly denies this. Others, with more justice, say that it is the fault of the manner in which the curd was produced too quickly, either by making the milk too thick, or by adding too much rennet, or by removing the cheese too soon to the cheese-room and hot room. The cheese-rooms are generally far too hot, and encourage this fermentation in the new-made cheese. They should be as cool and airy as possible. Some farmers prefer a stone floor for the cheese-rooms with reason. The chief cause, however, is to be sought for in the manner of making.

As may be supposed, the grazing of cattle is comparatively small in this dairy district. Some of the farmers, however, buy in small beasts, principally heifers, "burries," and turn them on the pastures in August. They remain there until the following spring, being occasionally supplied with hay, as the season may demand, and are then in good condition, and yield a fair remunerating price.

In the neighbourhood of Gloucester, however, a considerable number of oxen, principally of the Hereford breed, are fattened. If in poor condition they are bought in the spring, and, after running on the pastures until winter, are finished off in the stall. A more unprofitable way is to buy them in forward condition in the autumn, and fatten them on hay with oil-cakes. Some from the lower part of the country are sent to Bristol or Bath; but the greater part of them are destined for the field market.



[*The Sussex Ox.*]

SUSSEX.

Britons sought refuge from the attacks of their invaders in the fastnesses of the Weald of East Sussex. Thither they fled, and found, some of the native cattle of the country; and, from Devon, and, as will be presently seen, in the mountains and highlands of Scotland, they anxiously preserved them as relics of happier times, and records of what had been.

The difference between the Sussex and the Devon oxen is very great. They may betray the same origin. Lord Sheffield thought of two breeds of Sussex cattle; one the larger and coarser, resembling the Hereford, except that they had no white about them; the other a mixture of the old Sussex with other breeds from the west, and which having been fed on richer pasture, had more growth: the lighter breed bore about it unequivocal evidence of the same common stock as the Devon.

The description that we have of the Sussex ox is given by the agriculturist Mr. Ellman, of Glynde, to whom the eastern county is much indebted for the preservation of its native breeds, and for the great improvement of the South-Down sheep. He describes the Sussex ox as having a small and well-formed head; and as being much smaller than many other breeds, and even with the Hereford, smaller than that of the Devon; the horns pushing forwards and then turning upwards, thin, tapering and long—not so as to compare with the *long horns*, and yet in some cases a little more. The eye is full, large, and mild in the ox; but there is more restlessness and inquietness in the cow. The throat clean; and the neck, whether with either the long horns or the short ones, long and coarser than that of the Devon.

The main point of difference, and the principal defect of the Sussex ox, is its want of height. There is more wideness and roundness on the straight line from the summit of the withers towards the back, and no projecting point of the shoulder when the animal is

of all the organs of digestion ; yet the beast is well ribbed home, between the last rib and the hip-bone is often very small, and the hanging heaviness of the belly or flank. The loins of the Sussex are wide : the hip-bone does not rise high, nor is it ragged externally, large and spread out, and the space between the hips is well filled.

The tail, which is fine and thin, is set on lower than in the Devon. The rump is nearly as straight, for the deficiency is supplied by flesh and fat swelling above. The hind quarters are cleanly made, the thighs appear to be straight without, there is plenty of fulness.

The Sussex ox holds an intermediate place between the Devon and Hereford, with all the activity of the first, and the strength of the second, and the propensity to fatten, and the beautiful, fine-grained flesh. Experience has shown that it possesses as many of the good qualities both as can be combined in one frame. The Devons and the Herefords are said by some to have been improved by one judicious cross with the other ; but a cross with the Hereford often produces, in the Sussex, a better animal, it is true, yet not fattening so profitably, or working so well. Some graziers, however, have very ingeniously explained this, by the different parts on which the Hereford and Sussex cattle usually carry fat. The Hereford bears it upon the ribs and the sirloin ; the Sussex more on the flank and the inside. There may be some truth in this, it cannot be denied that the Herefords carry theirs in the best place, it is on this account that the prize is so often adjudged to them at the cattle-shows, and particularly at Smithfield. When the Sussex is crossed with the Devon a lighter breed has resulted, but not good for activity, while it is materially deteriorated in its grazing properties.

The Sussex ox is of a deep chestnut-red—some, however, are of a blood-bay : much deviation from these colours generally indicates a cross or stain in the breed. The black, or black and white, which is sometimes met with, generally indicates a cross from the Welsh. The Welsh

* Mr. W. Pitt, the author of some of the Agricultural Surveys, pronounces the Sussex to be comparatively much inferior to a good selection from the Lancashire, Herefordshire, and Shropshire breeds ; and he says, "I cannot help thinking them, on comparison with other breeds, though a weighty, yet an uncouth and coarse animal." On this Mr. A. Young very properly remarks, "There is no knowing what is meant by such assertions as that Sussex oxen are uncouth and coarse animals. If it implies a thick and rough hide, or a hard and coarse-grained flesh, nothing was ever more moved from fact than such an assertion. Sussex oxen are as remarkable for the thickness of their hides as they are for the closeness and delicacy of their flesh. In the Herefordshire long-horns, there does not exist any shadow of comparison for feeding or working. In quality of flesh, thriving disposition, &c., both the Sussex and Hereford exceed you, and Hereford leaves you far behind."—*Survey of Sussex*.

Lord Sheffield has spoken must not be forgotten ; of them has given rise to much of the confusion and exist in the accounts of several writers.

the labour performed by oxen is different in different About the South Downs, oxen are much employed, an equal degree to horses. In the weald of Sussex, r share of the labour ; and on a farm of about 100 y a horse and an ox team—on a larger farm there are arms of 150 or 200 acres have from ten to twelve se have grass and straw until they begin to work, mixed with their straw.

d is always slow, and soon after six years old, it can at all with advantage. The lighter breed, the true entury, will step out as light and as fast, and will do c as any horse, and stand as many or more dead pulls. en known to travel fifteen miles a day, with heavy cessive weeks, and without the slightest distress.

ch some of them possess proof was given when a miles against time over the Lewes race-course, and tance in sixteen minutes. Formerly, as many as four not unfrequently seen attached to a single plough or rtainly used to pull well together ; but they who un- and the honesty of these animals rarely attach more ne of them have been worked, and particularly by Lord in every respect like horses, and they answered as truly rein.

spayed heifers both for the plough and for draught, tage. Many farmers keep their oxen as long as they work well, and sometimes until they are twelve years ain that the beasts will then fatten quite as well as at d Sheffield fattened two of more than twelve years, to 210 stones. Experience, however, does not confirm e. An old ox takes longer to fatten than a younger ere is generally a patchiness and unevenness about him, e the eye, or answer in the market. Other farmers much shorter period ; and they believe that if they have at work on their farm, the most profitable plan is to very year, and break in an equal number to succeed will thus be broken in at three years old,—worked until a fattened, and if they do not always grow to so large more rapidly and profitably.

Sussex
done a
then, w
and an
and so
The
over ;
of one
pared
oxen.
grass
incre
one
the
and s
spring
other
Stal
used t
He m
were f
made,
The
broug
stant
fatten
turst,
oxen,
much
particu
will fat
The
about
One b
crown
should
middle
of the
Mr.
them 6
heart.

Sussex oxen in the eleventh year of their age, which for seven years done as much ploughing and carting as any two horses in the county then, with half a summer's grass after having been taken from the field and an autumn's *rouen*, they were, without other food, sent to Smith and sold for eighty guineas.

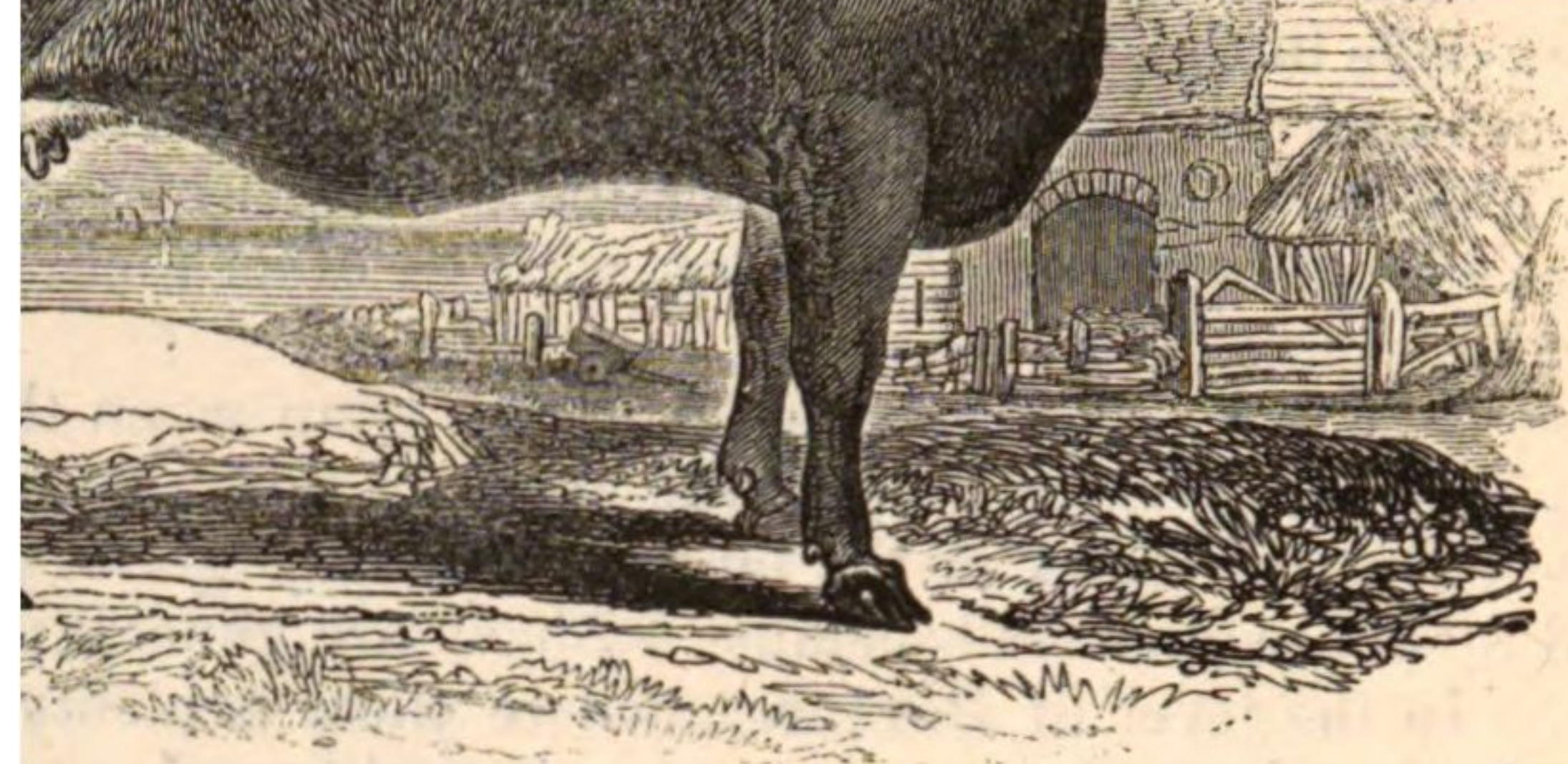
The oxen are usually drafted from the team when the spring-sowing is over; they are then turned into the lower or marsh land, in the proportion of one ox to an acre, if the land is tolerably good, and are then prepared for the winter stall-feeding. Sheep are generally mingled with the oxen. In the level of Pevensey, where there is plenty of water, and grass is abundant, there are many cattle, although sheep are even now increasing; but at Winchelsea and Rye, there are most sheep, and one bullock to every four acres, in order to keep the pasture even. When the hay is cut and carried, the pastures are usually occupied by cattle and sheep; but the reservation of *rouen* for the pinching part of the spring when all artificial provender fails, or before the young clover and other grasses have begun to shoot, is comparatively unknown.

Stall-feeding is very much practised in Sussex, and Lord Egmont used to have his milch cows tied up during the greater part of the winter. He maintained, that one-third of the food was saved,—that the cows were fed with a fourth part of the usual trouble,—that more dung was made,—and that there was no poaching the ground.

The oxen are gradually accustomed to their stalls; they are brought in only at night; but, as the winter approaches, they are constantly tied up. Comparing even the system of yard-feeding with fattening in stalls, Mr. Ellman, of Glynde (a skilful as well as zealous agriculturist, and whose opinion is of weight in cases like these), found that the oxen, fed loose in the yard, consumed, in destroying as well as eating, as much as twelve oxen that were tied up. Many graziers, however, particularly in the midland districts, maintain that an ox loose in the yard will fatten quicker than one that is tied up.

The average weight of the Sussex cattle when brought to Smith's was about 120 stones; but they have been slaughtered as high as 216 stones. One belonging to Mr. Ellman, weighing 214 stones, measured from the crown of the head to the rump, 9 feet 6 inches. The girth before the shoulder was 9 feet 5 inches; behind the shoulder, 9 feet; round the middle, 10 feet; round the flank, 9 feet; and from the nostril to the tip of the tail, was a distance of 14 feet 8 inches.

Mr. Edsaw, of Fettleworth, who was partial to large cattle, brought them 6 feet high behind, and $5\frac{1}{2}$ feet before, and $10\frac{1}{2}$ feet girth over the heart. Two of them weighed 216 stones each.



[*The Sussex Cow.*]

Young thus describes what the Sussex cow ought to be, found to resemble the portrait:—"The true cow has a hair fine, and the skin mellow, thin and soft; a small thin, clean, and transparent, which should run out horizontally turn up at the tips; the neck very thin and clean; a straight top and bottom, with round and springing loin, hips, and rump wide; shoulder flat—but the proportion of the shoulder is not liked, as the cattle subject to this is coarse; the legs should be rather short; carcass large; level with the rump: a ridged back-bone, thin and great defects in this breed."

does not answer for the dairy. Although her milk is good, it is so inferior in quantity to that of the Holderness that she is little regarded for the making of butter. Every mongrel breed finds its way into the Dairy in preference, a cross, however, has been attempted, and with some success. The Sussex and the Suffolk, retaining to a very fair degree the properties of the one, and the disposition of the other to give a considerable quantity of good milk.

It is said, that "while the Sussex oxen carry too much weight on their backs, the heifers and cows are better made, and carry more weight on their backs;" and he affirms that "they are sure to give a good pail, and handsome." The cow is lighter before, and in other points; and as to her being good at the pail, few of them are kept as dairy cows, even in Sussex, is a proof that they are not so.

There are, however, exceptions, to this. Lord Hampden, of which, in the height of the season, yielded ten pounds of milk and five pounds of cheese every week, and yet her quantity of

remedie
are ofte
deavou
on whi
They
at the
cannot
are m
Herefo
milk
It mu
even
shall
puer
stimu
Ne
that w
a deci
Ne
breedi
ing an
select
posed
olds,
year,
being
femal
cut at
and a
until
the fir
and o
are br
will s
Mr
work
They
is give
milk
by ho
in the

remedied. Their very countenance indicates an unquiet temper; and they are often restless and dissatisfied, prowling about the hedge-rows, endeavouring to break pasture, and especially if they are taken from the ground on which they were bred.

They are principally kept as breeders, all the use being made at the same time as dairy cows of which circumstances will admit. It cannot be denied that they are generally in fair condition, even when they are milking; and that no beasts, except their kindred, the Devons and Herefords, will thrive so speedily after they are dried. The second milk being stopped, the Sussex cow will fatten even quicker than the Devon. It must, however, be acknowledged that the Sussex cows are not so good even as breeders; and that, unless a great deal of care is taken that they shall not be in too good condition at the time of calving, she is subject to puerperal fever, or 'dropping;' while many a calf is lost from the stimulating quality of her milk.

Next to the cross with the Suffolk for the improvement of the breed, that with the Jersey, or French cow; but there can scarcely be said to be a decided breed for the dairy in any part of Sussex.

Nearly all the calves are reared,—the males for work, and the females for breeding or early fattening. The following is a fair specimen of the milking and grazing department of an ordinary East Sussex farm. A farm is selected, on which eight cows, on the average, are kept;—then it is supposed that there will generally be six calves, six yearlings, six two-year-olds, four three-year-olds beginning to work, four four-year-olds, four five-year-olds, and four six-year-olds. On some farms the calves are calculated to be equal to the number of cows, occasional losses excepted, equal to the number of cows, the females are quite sufficient to keep up the stock. The calves are generally cut at seven weeks old; they are permitted to suck for ten or thirteen weeks, and are weaned by being shut up, and having a little grass given them until they have forgotten the dam, when they are turned out. In the first winter they are fed with the best hay, and after that they have only hay and occasionally some straw, until the second Christmas is passed, when they are broken in for working. A good cow, after her own calf has been weaned, will suckle another, and sometimes even two others, for the butcher.

Mr. Young gives the following, as Lord Egremont's cattle system for work:—"The calves are dropped from December to the end of February. They are weaned immediately, never letting them suck at all; but they are given for three days as it comes from the cow. For weaning off the milk they ought to fall about December, and then they should be kept in by housing, and thus they will be equally forward with calves dropped in the spring that run with the cow. With the skim-milk some oaten

four years and a half, and then fattened." in the winter they work three days in the week, and every day. Mr. Young adds a remark which may deserve notice when an ox will not bear hard work and hard food, to fatten, and, probably, he will thrive as well as one who has done hard work and hardship better, for the qualities of fattening and hard work, are distinct.

changed every two years by the best breeders, from the time the breeding *in and in* will cause the stock to de-

working in collars instead of yokes was once very prevalent, but experience has not shown that it is decidedly superior method of yoking them to the ploughs.

of Sussex there is a breed of black cattle, said to have been introduced by Mr. Marten of Tirlé. They are probably a cross of the English and South Wales bull, and they retain a great deal of the qualities of the best blood of Sussex. They are as heavy, and work as hard, and are exceedingly troublesome to break in.

In Sussex, little can be said with regard to any prevailing breed. Mr. Hack, who resides in the neighbourhood of Chichester, is indebted for some excellent remarks, fattens some of the best, and prefers the Pembrokeshire black oxen, for they are more hardy, and can better endure every variation of temperature. Mr. Stethwaite, of the same neighbourhood, describes the prevailing breed as consisting of a strange mixture of short-horns, Devons, Sus-

Mr. Henry Freeland, of Appledram, near Chichester, breeds the Sussex with the Suffolk polls for the pail.

KENT.

in Kent, or the weald of Kent, the Sussex oxen are much used for the road; but there, as in Sussex, the dairy cattle are not so numerous as in other counties. They are principally Welsh, or a strange mixture of the Sussex, the Staffordshire, and the Welsh. In the weald, the Sussex cattle are, with very few exceptions, used for the purpose of grazing. Their young cattle, of both sexes, are usually sent to Romney Marsh in the summer. The farmer would not know what to do with his bullocks at that time, because most of his pasture must be reserved for hay, or

They are sent about the middle of May, and return at

The practice of fattening cattle with distillers' wash comes from Bromley: it was afterwards adopted in the distilleries of Mids which we shall give a particular account in the proper place.

So far as cattle, however, are concerned, Kent can scarcely be either a breeding or a dairy county. In the east of Kent few cattle are bred. The polled Scots are bought for summer or the Welsh are purchased at Canterbury, or other markets. Principal dairy cows are selected from them; the rest are kept in the for the winter, and in the spring are placed among the sheep, fatten rapidly, and reach from twenty to twenty-two scores.

Some graziers buy Welsh calves in the autumn, and put them to keep in the farm-yards for the winter: in the spring they place them among their sheep, where they get fat in a few months, and weigh 18 to 22 scores.

In some parts of Kent oxen are stall-fed on oil-cake and hay for the purpose of supplying manure for the hop-grounds. This purpose probably be answered, in regard to the manure, but the fattening of an ox in this way must be far from profitable.

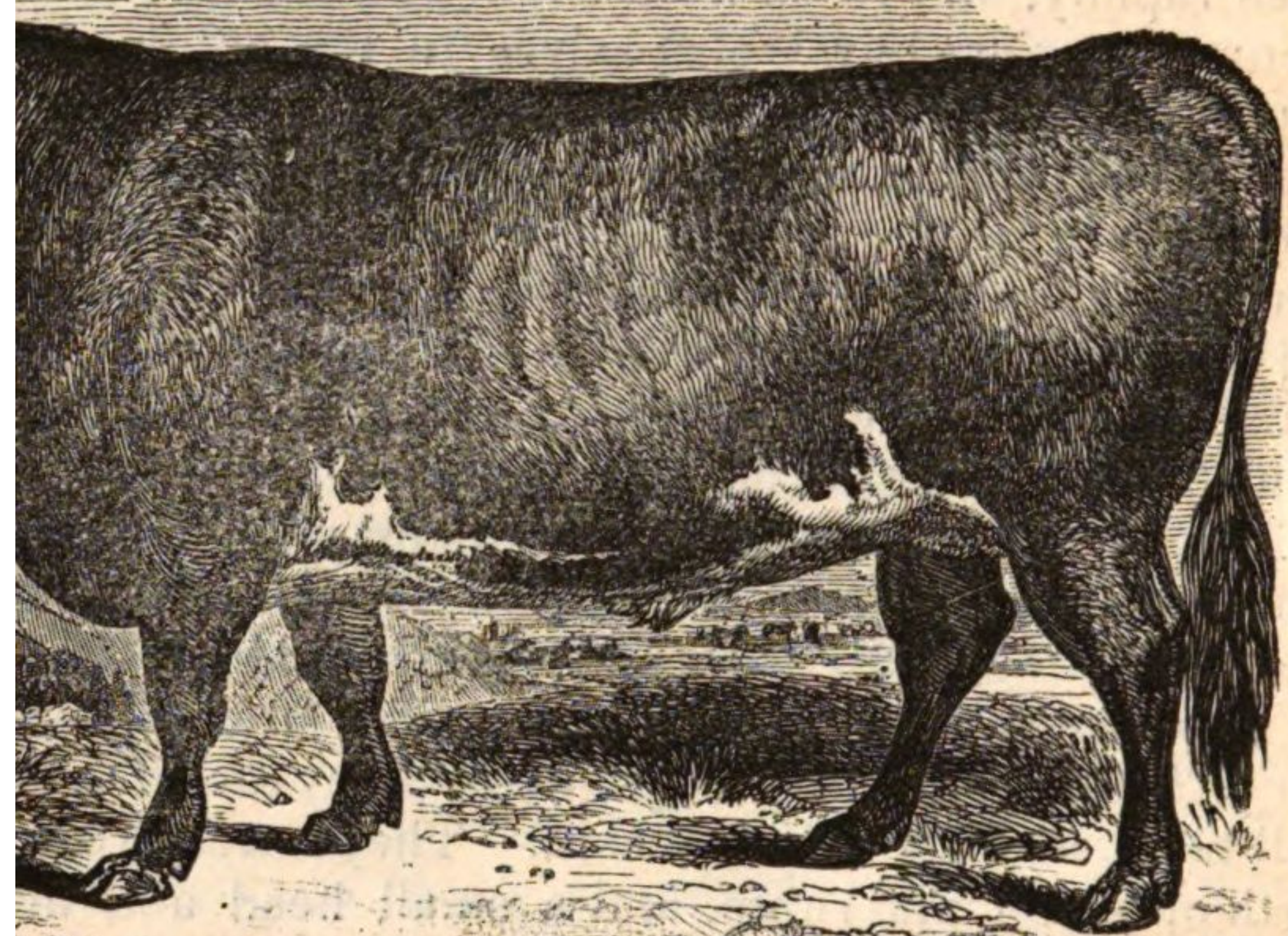
There are very few dairy-farms in any part of Kent; sufficient land, to keep a few cows to supply the family with milk and butter, perhaps a little fresh butter for sale, is all that the best upland farms want.

The native cattle of Kent deserve more attention than has been paid to them. Mr. Boys says, that "they are of a deep-red colour, small bone, and a kindly-soft skin. They have a great breadth of length of sirloin and rump, and a small head and neck; the head and standing upwards, and they have a ready disposition to fatten."

WALES.

To the Principality we naturally look for some trace of the native cattle, for the Welsh were never entirely subdued by any of the invaders. The Romans possessed merely a portion of that country. Saxons scarcely penetrated at all into Wales, or not beyond the of Monmouth; the Welsh long resisted the superior power of the under the Norman kings; and it was not until late in the thirteenth century that the Principality was annexed to the crown of England. We therefore expect to find more decided specimens of the native produce of our island: nor are we altogether disappointed. Howell the Good, describes some of the Welsh cattle in the tenth

...speak also of the dark or black coloured breed, and which is general throughout the principality. The most valuable portion of the cattle of Wales are they are indeed stunted in their growth, from the scanty mountains yield, but they bear about them, in miniature, of the Devon, Sussex, and Hereford cattle. We will little of South Wales.



[*The Pembroke Ox.*]

SOUTH WALES.

PEMBROKESHIRE.

is not afford a more useful animal than the Pembroke back ; the great majority of them are entirely so ; a few a little white about the tail, or the udders ; and the the latter turn up in a way characteristic of the breed, eral form of the cattle undeniably betrays their early shorter legged than most of the Welsh breeds, but ntgomeries, and have round and deep carcasses. They ely look and good eye. The hair is rough, but short, thick. The bones, although not so small as in the

ginal c
howeve
but not
The
and, in
each, a
resemb

The
fit for
ing as
gan,
bers
well
the c
Pemb
other
of the
for th
sional
along
clean
chine
in go
an oil
gard
these
cow i
of but

THE C
who v
his ag
by a s
at Wi
valuab
state
David
breede
testim
gation

ginal cattle of North and South Wales are essentially the same; they are, however, finer in the head, neck, and breast, than the Anglesey but not so fine as the Glamorganshire cattle.

The Pembrokes are found in Carmarthenshire, Cardigan, and I and, indeed, in every bordering county, mixed with the different breeds, each, and imparting to each its very best qualities. They bear no resemblance to the Kyloes.

The Pembroke ox is, like the Devon, a speedy and an honest worker, fit for the road as well as the plough,—and when taken from work going as speedily as he does. He is not quite so tractable as the Glamorganshire, but easily managed if no foolish violence is resorted to. Great numbers of them are brought to the London market—they stand their ground well and find a ready sale, for they rarely disappoint the butcher; the contrary, prove better than appearance and touch indicated. Pembroke oxen get rid of their steer-like appearance sooner than other cattle. At three years old they have generally the true character of the ox about them; and, in their fourth year, they are usually sent for the market. The Pembrokeshire cow is usually black, with occasionally a dark brown, or, less frequently, a white face, or a white along the back. Mr. Davies describes her as being “fine-boned, clean light neck and head, small yellow horns inclining upwards, chine and loin, round long barrel, thin thigh and short legs: she is in good condition if tolerably kept, and has a rich wave in her hair, an oiliness of skin, which ever denote thriftiness.” This is true with regard to some of the best cows, but there are many exceptions. With these good points, proving her value as a grazing animal, the Pembroke cow is, as we have described her, a very fair milker, and will yield a pound of butter per week during the dairy season.

GLAMORGANSHIRE.

THE Glamorgans were once in high repute, and deservedly so. George, who was a good judge of cattle, was very partial to them, and his agents yearly visited Glamorganshire, to keep up his Majesty's table by a selection of the best cattle that county could produce; and the same at Windsor is still frequently recruited from this district. For the valuable portion of the following account of their early history and present state we are chiefly indebted to Mr. Moggridge, of Newport, and David, of Radyr. To the latter gentleman, whose tact and skill as a breeder need no eulogy of ours, and whose side-board is loaded with testimonies of the superiority of his cattle, we acknowledge peculiar obligation. We have also extracted some useful matter from Davis's

which island are also recognized by the peculiar swelling and lofty bearing of the head; or may we consider this state-
ment as indicative, in both districts, of the native breed? I
should say that Sir Richard de Grenaville, one of the Knights
among them the Lordship of Neath, also possessed the castle
on the northern coast of Devonshire, and introduced many of
this we can easily imagine, for in the old red-cow,
I recollect nearly fifty years ago, an admixture of Devon
may be for a moment mistaken, and it is even yet evident in
its lively countenance, and the deer-like head and neck. The
colour was then degenerating into brown, and the brown has been
coming from crosses with the Pembroke black. Some of the
may be met with occasionally in the hilly districts, and
in the neighbourhood of Aberdare; but the poverty of the soil
diminished their size. Not a great many years ago there was in
the Neath and the Towy, a breed of cattle of a light red
and white faces, which were said to have been the ancient
breed of Glamorgan. Although not so large as the brown
ones, they were good milkers, and fattened kindly. They
were, always bare, but occasionally crossed with the stunted
neighbouring parts of Carmarthenshire.
Glamorganshire farmers, of half a century ago, took great pride in
and evinced much judgment in their breeding and selection.
The principle from which they never deviated;—*they admitted
foreign blood*, and they produced the Glamorgan ox, so
for activity and strength, and aptitude to fatten; and the
to vie with the best milkers, yielded a good remunerating
return to the owner.

They had a dark-brown colour with white bellies, and a streak of
white back from the shoulder to the tail. They had clean
flesh from the neck and shoulders; long white horns, turning
inwards, and a lively countenance. Their dewlaps were small, the hair
was short and silky. If there was any fault, it was that the rump, or
the tail, was too high above the level of the back to accord
with the notions of symmetry.

This breed was eagerly sought after by the most skilful
breeders in the West, Northampton, Warwick, and Wilts. Their aptitude
made them exceedingly profitable when taken from the plough
at three years old, and they were brought to great perfection on the
pasture,—frequently weighing more than twenty scores per
head. The beef was beautifully veined and marbled, the inside of the

the
of it
plough
ment
were
atten
and
of the
to la
whe
land
bar
bre
mar
eatt
high
cons
T
alter
sold
serio
this
at th
A
been
resto
coars
a gre
A
Mr.
of th
The
stock
fully
has
silver
Th
be, in
to reg
capita
face

the attention of the Glamorganshire farmers to the increased value of it, and a great proportion of the best pastures were turned over to plough. Turnip-husbandry necessarily followed; and then the improvement of their sheep-stock became an object of importance, and the cattle were almost entirely neglected. A proper selection for breeding was attended to; the calves were generally weaned at two or three weeks and nursed on milk and water, hay-tea, and boiled linseed; the milk of the cow being entirely reserved for the dairy. The steers were put to labour when they were two years old, and seldom exceeded four years when they were disposed of; they were depastured in summer, the land too wet to carry sheep, or too bare for corn, and in winter they barely existed in the straw-yard.

The natural consequence of inattention and starvation was, the breed greatly degenerated in its disposition to fatten, and, certainly with many exceptions, but yet, as their general character, the Glamorganshire cattle became and are flat-sided, sharp in the hip-joints and shoulders, high in the rump, too long in the legs, with thick skins, and a weak constitution.

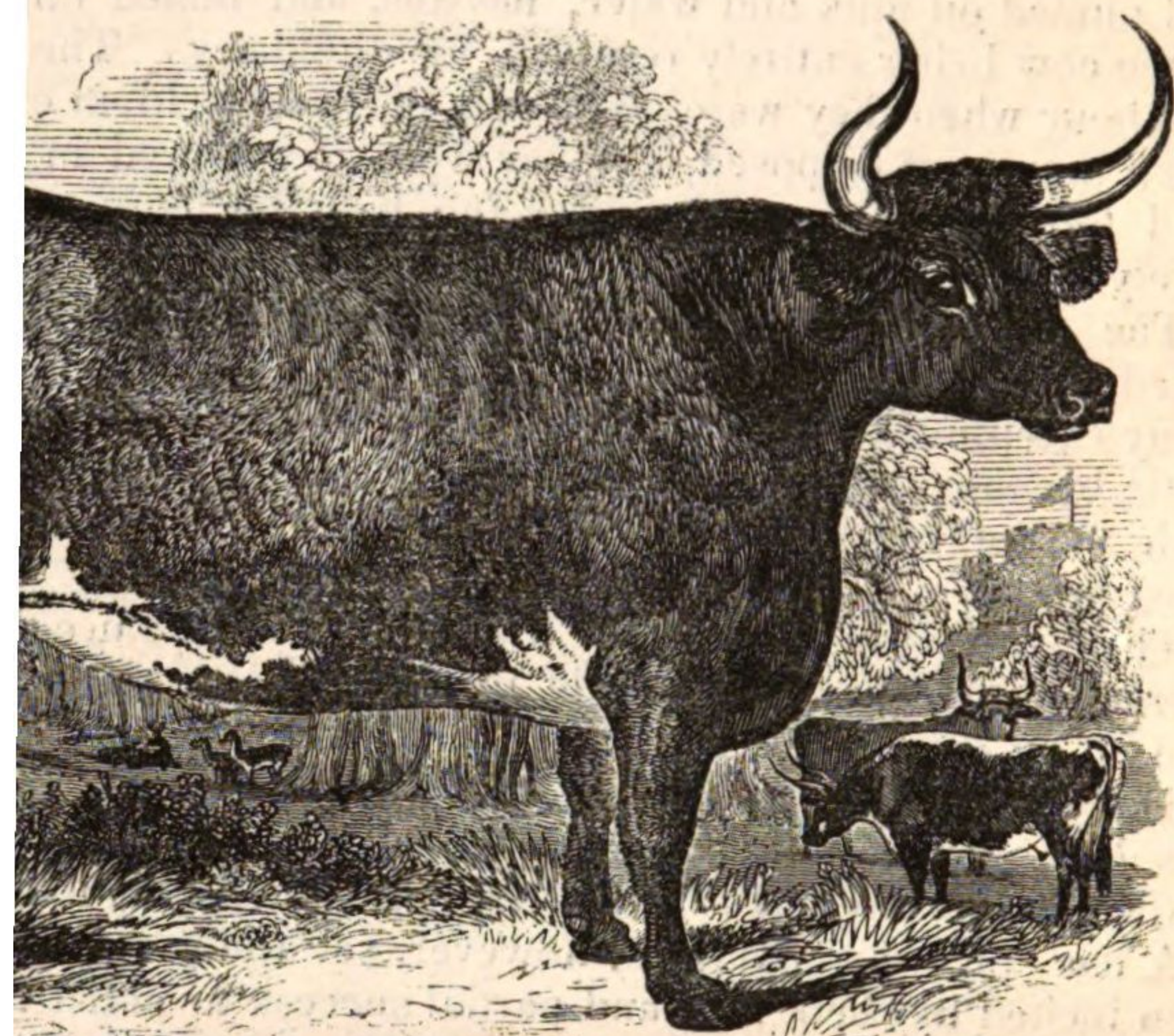
The Glamorganshire farmer was startled at the necessary result of the alteration of system. His cattle, instead of being eagerly sought after and sold at an extravagant price, could scarcely be sold at all, or at a very serious loss. He was unwilling at first to acknowledge the real cause of this deterioration and diminution of value, and many of the breeders at the present day, take little or no pains to redeem their error.

A few spirited individuals, however, set the example; and others have been incited by their zeal and partial success to assist in endeavouring to restore the breed to its former pre-eminence, or, at least, to adapt it to the coarser fare which, under the altered state of husbandry, must now be its lot.

Among these, and one of the most skilful and successful of the breeders, is Mr. David, of Radyr, whose sketch of the deterioration and regeneration of the breed we are giving our readers in a somewhat condensed form. The result of these attempts has been, that, in the recent exhibition at Tredegar, the revived and pure Glamorgans have often successfully competed with the short-horns and the Herefords; and Mr. David has received, at Sir Charles Morgan's cattle shows, no less than three silver cups for his Glamorgans.

The work of improvement, however, as yet has been, and can only be, in few hands. It is comparatively easy to keep up a good breed, but to regenerate a bad one, or, at least, a deteriorated one, requires capital, and perseverance; and these called into active requisition in the face of hard times, and with little or no prospect of obtaining remuneration.

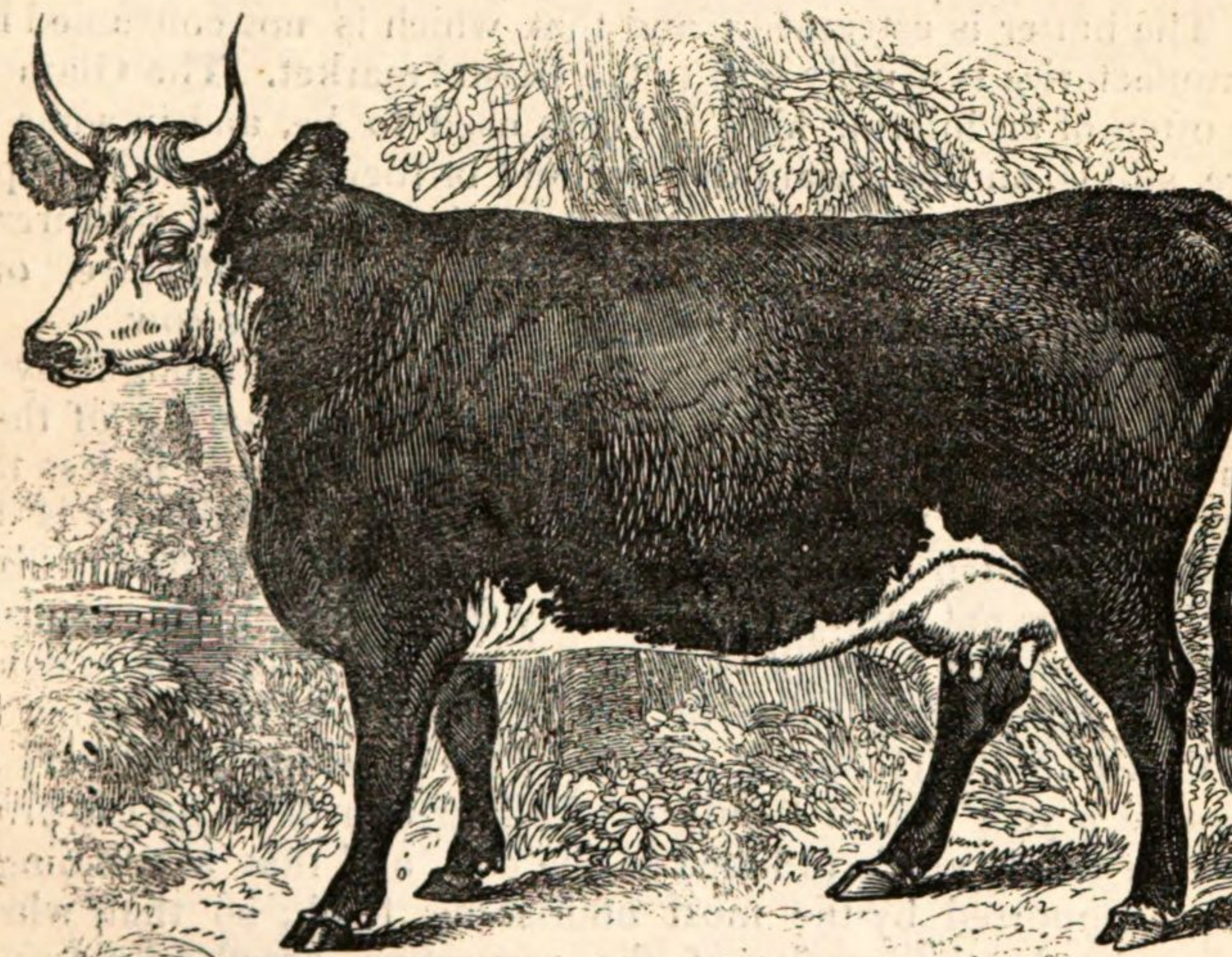
roducing the old breed, which combined so much of
cies; and therefore he, and the most scientific breeders
an to be weary of this strict adherence to the Glamor-
d to consider whether it might not be possible, by judi-
the cattle of other districts, to obtain an animal better
nt state of the country.



[*The Glamorganshire Ox.*]

he grazier were first considered, and the comparative
g in the present Glamorgans was attempted to be ob-
with the Hereford bull. This to a considerable extent
imal was produced well adapted for the grazier; dis-
e flesh, and of a hardier constitution: but the ox was a
e yoke; the beef, as is the case with every animal that
maturity, was not so fine; and the value of the cow
inished; she was neither so good a milker, nor nurse.
ttening of an animal that grew to so great a bulk as the
and Glamorgan, interfered too much with the present
ganshire husbandry; and the produce of this cross did
the scanty fare on which it was compelled to subsist.
and not duly appreciated fact, to which we shall often
lude, was also here very apparent. The advantage of

earth into human food ; and they inquired whether their soil and situation for markets, and their mode of agriculture, were best for a machine to produce beef, or milk. The character and ha employment of the inhabitants of Glamorgan had essentially Mines had been sunk, and manufactures had been established in every part of the county. It was become a very populous district, in which dairy produce would always command a ready sale. In accordance with this, the good old custom still prevailed in this county, of farmers being kept under their employer's roof ; and their diet, in order to be both wholesome and economical, was chiefly derived from the dairy. Therefore, the old Glamorgan could with so much difficulty, or so much expense, be reproduced, the attention of the farmer was gradually directed to the dairy.



[*The Glamorganshire Cow.*]

At first he was unwilling quite to sacrifice the old pride and his native county ; and he endeavoured once more to accomplish his objects, and he had recourse to the short-horns. A very little experience, however, convinced him that his labour would here be lost. He did not indeed the milk, but he somewhat deteriorated its quality ; and the cow was slow and sluggish, and not calculated for labour, and would not

and fat are laid equally over them—the beef is beautifully
yield a more than average quantity of milk. They are
on at five years old, but not often at an earlier age; and
ently bulky on the good pastures of the vale without any
the hilly districts many of the old Glamorgans remain,
made to restore the character of the pure Glamorgan
s ago, but without that degree of success which will
the farmer.

preceding page is the portrait of a valuable cow, belong-
airy at Windsor, and gives a faithful representation of
ved breed of Glamorgan dairy-cattle.

antity of milk given by a Glamorganshire cow is about
day. The principal object of the dairyman is butter,
age produce of each cow is at least 1 cwt. during the
er is esteemed; and that which is not consumed in the
es is usually sent to the Bristol market. The Glamorgan
an inferior kind. There used to be, and in some mea-
an unpleasant dryness and brittleness about it, depend-
some persons, on the clover in the natural pastures, but
to some mismanagement in the manufacture, or the
milk which was mingled with that of the cow.

ishment of a dairy breed, it has been thought by some
ch of the old false economy in the rearing of the calf
duced. He is early weaned; frequently in less than a
little more than a fortnight, and after that he is badly
e fed—skim milk, and not too much of that, is his only
s not perhaps to be strictly defended, for it is practised on
y be brought to grow to a large size, and whose constitu-
proved, is none of the hardiest: yet, on the other hand,
f the Hereford, or even of the short-horn, is a very supe-
ear old, it should not be forgotten that he has probably
le year's produce of the cow, and that at weaning time
rted by the most nourishing food; so that, when the
s, the profits of the respective breeders may not be
pecially if two or three cwt. of cheese and butter are
of the Glamorgan yearling.

other serious defect in the system of Glamorganshire
lf appears to fatten more than usually kindly, it is forth-
tcher, and not reserved, as it should be, for the purpose
electing their cattle, the first and almost only considera-
to their milking qualities; and a full udder will outweigh
rich might be made to their flat sides, large offal, long

While the *vale*-cattle are wintered, and often badly enough in the yard, the *hill*-cattle have nothing but hay from poor peaty land, whose produce is not more than seven or eight cwt. to the acre, and are rarely or never manured. Notwithstanding this they thrive, and their meat is of a superior quality, and they are much sought after in the market.

The Glamorganshire cattle continue to prevail in Monmouthshire, of which, although not strictly a Welsh county, and far more than a breeding district, it will be convenient next to speak.

MONMOUTHSHIRE.

HERE likewise Mr. Moggridge is our chief authority.

Monmouthshire may be divided into the *hill* and *vale* districts. The cattle of the HILL COUNTRY were probably derived from crosses of Brecon blacks with the Glamorgans. The latter predominated, and continued so to do, to the visible improvement of the breed.

Within the last few years, however, a great number of Irish cattle found their way to every part of the Bristol channel by means of steam-boats, and they were offered at prices so inferior to the natives that they were greedily purchased. Not only, therefore, was the improvement in the Monmouthshire cattle arrested, but the hill cattle were threatened with ruin, for they could scarcely sell their beef at a fair price. If this system is longer pursued, the breeding of the natives will be in a manner abandoned.

Some Durhams have been lately introduced in the neighbourhood of Pontypool, but with doubtful success. The Ayrshire cow has found its way into some of the hill-dairies, and is much valued; while great numbers of Scotch cattle are brought into the districts immediately connected with the iron works, and even bred there. They live well on the rough pasture, and are soon fattened at the end of the season.

Many of the native cattle, however, continue to be fattened in the hill district, and are thence driven into the richer pasture of the central counties to be finished. They are good milkers, although not equal to the Glamorgans, of whose blood they inherit a considerable portion. Their appearance is very much against them, and they will not thrive even on good land.

The use of cattle for husbandry has been declining for many years, owing to the canals and railways which intersect the county, and to the frequent increased demand for horses: but should the introduction of steam engines hereafter banish the horse from the mining districts, the use of cattle in rural affairs may probably be resumed, to the future advantage of the county.

, were, as the intelligent judge of the cattle appropriately *remendously fat*. At what expense they were made so considered so seriously as it ought to be. For the dairy is able that some valuable breeds may arise from crosses of a bull and the best of the vale cows. The Herefords are the way into the dairy: they belong to the grazier and

Now is the Glamorgan, with some of the middle-sized hills.

Most of the labour of the vale husbandry is performed by the roads of Monmouthshire, even more neglected and worse than generally are, compel the farmer to keep more horses than

A tract of land comprising many thousand acres, that is neither hill nor vale, and is locally known by the name of the Gwent all the flat land bordering on the Bristol channel. This is meadow-land, and naturally of very superior quality. The stock used to be Glamorgans, and they were well managed with judgment; but during the last few years of the times has paralysed all enterprise, and the stock has evidently deteriorated. The Irish cattle crossed this tract from the interior, and too many of them loitered here and there in a manner naturalized

CARMARTHENSHIRE.

It is so be divided into the hill and vale districts, and the difference between the two is very dissimilar. The hill-breed betrays much

Mr. Walker tells us that this is too strongly expressed. It is his opinion that it is not so much a matter of management to bring them into the dairy. Being so adapted to the grazier, their milk is quite neglected. The Herefordshire farmers keep their cows and heifers calve between the middle of December and January, and are entirely on dry meat, and, therefore, by the time the grass comes, they are dry; but if the Hereford heifer calved for the first time at grass, in May, she might become a good milker. Some of the cows will, in the autumn, yield from ten to twelve quarts of milk at one time, and that of any other cow except the Alderney. The quantity of milk they yield depend on her treatment when with her first calf. If she has not good milk veins at first starting, she will never afterwards make a good milker. A cow has seldom a fair chance here. 'I speak from experience,' says Mr. Walker, 'I have much to do with the Herefords for several years, and have always had the best cows of that breed.' These are very important observations; and, sufficiently convinced to alter what we have written, and what we have said, we are glad to see that the facts and belief confirm, the remarks of Mr. Walker deserve serious

mediately, and continued ploughing with them until the barley seed was over. They were fed on straw, with some turnips, and when they were worked unusually hard a little hay was allowed. In the summer they went daily eighteen miles for lime. They had then a little rest, but they were worked again at wheat-sowing, and sold in the following January for 5*l.* each more than their prime cost.

The average produce of the Carmarthenshire cow is about 100 lbs. of butter during the dairy season, with nearly double the quantity of cheese. In the vale of the Towy a greater quantity is yielded, when the river flows its banks in the winter, or early in the spring, for the pasture is then richly manured for the following season. A summer flood, however, materially injures the feeding-grounds, and lessens the produce of the dairy.

CARDIGANSHIRE.

THE Cardiganshire cattle belong to the Pembroke or Carmarthen breed, or are a mixture of the two. Mr. Walker says, that the Carmarthen and Cardigan cattle are so much alike that he scarcely knows how to distinguish them. They are not quick feeders, nor do they ever carry much fat. The little flesh that they have upon them is very good. They pay more for running upon tolerable land among the sheep, than they would do in the mode of stall-feeding. Mr. Lloyd, in Davies' Survey, more truly says, that they are hardy, work and travel well, and take on fat kindly; but the best improvement that could be made in the management of them would be to give them better food in winter.

In speaking of Kent as a grazing county, we have mentioned that great many Welsh are fattened there. A considerable portion of these are from Cardiganshire; and, for small beef, they find a ready sale in the London market.

The Cardiganshire cows are not to be despised for the dairy. Mr. Lloyd averages the produce of an ordinary cow at 80 lbs. of butter and 100 lbs. of cheese in the season. Other farmers average it at from six to eight score lbs. of butter, with a corresponding quantity of cheese. This computation seems to be the nearest to the truth. The butter is sent to the coast, or to the iron-works of Glamorgan and Monmouth: the cheese is sold for home consumption.

BRECKNOCKSHIRE.

THE usual breed of this county is truer than many of its neighbours, and of native origin. The middle-horn may be clearly traced with many of the excellencies of that division of cattle. Much cannot be said of the Brecknockshire cattle.

successfully, mainly to improve it. They have principally
course to the Herefords as a cross with their own cattle,
they have thus produced a beast, too large, and too capable
to be perfected on their poor land, they have obtained one
and pay everywhere else, and that will consequently find a
The general colour is red, or brindled, and the true
Hereford marks the source whence the improvement in
derived; the red heifer, however, with a dark and smoky
request for the dairy. The dairy-women began to com-
much *soap* had come into the country,"—that the red had
from the faces of too many of their cattle; for it cannot be
ough the Hereford-cross increases the size, and does not
dency to fatten, it very materially lessens the quantity of
opshire on the north, and Herefordshire on the east, they
ials at command, and they have wisely and diligently used
be truly said that they have got the start of most of their
he breeding of good cattle. The Radnorshire farmer
his ground, but the cattle have plenty of food both in
er, and on which they rapidly thrive, however coarse it
alves in this county are usually taken from the cow at the
week or nine days, especially if the farmer wishes the dam
The young animal is then suckled by the hand with new
five weeks, when gruel or linseed-tea is gradually substi-
neaded pellets of barley, or pease or bean-meal, or vetches,
ses of suitable size are appropriated to the calves—the soil
the herbage sweet, and the stubbles being always pre-
en after harvest.

NORTH WALES.

ave placed the cattle of North Wales in the same chapter
'horns,' we confess that we are a little approaching to the
he long-horns.' There is however a great deal of the cha-
ddle-horns' about them, and marking their common origin,
on perhaps of some of the Anglesey oxen; but their pecu-
pearance is to be traced to a practice which we shall pre-
describe. North Wales, considered as a cattle country,
into two districts. In the first the rearing of cattle is almost
ded to; in the second, the dairy is a matter of consider-
ary regard. The first will include Anglesey, Carnarvon,
and to the second belong the counties of Denbigh, Flint,

the cattle were compelled to swim across the strait, were surprising, although the current was rapid and the water was deep, and the y were sometimes swept down the stream even so far as three or four

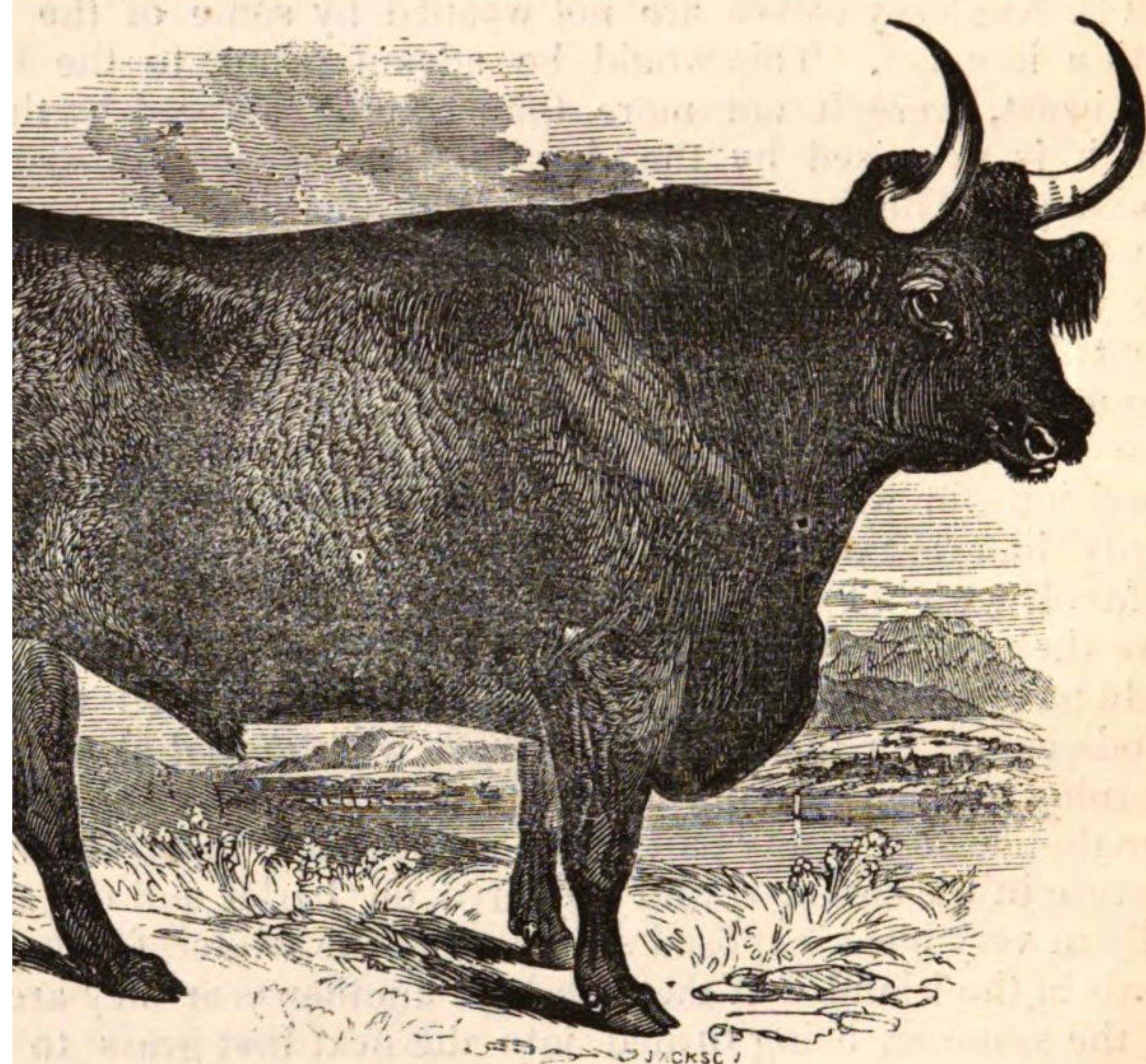
The Anglesey cattle are small and black, with moderate bone, deer rather too heavy shoulders, enormous dewlap, round barrel, high spreading haunches, the face flat, the horns long, and, characteristic breed with which we will still venture to class them, almost invariably turning upward. The hair is apparently coarse, but the hide is rough they are hardy, easy to rear, and well-disposed to fatten when transferred to better pasture than their native isle affords.

The Anglesey calves are not weaned by some of the smaller until a late age. This would be advantageous to the future growth of the beast, were it not more than counterbalanced by the false economy which is practised by the Anglesey housewives during the period of suckling. The young black cattle of this island have little more than hay-tea, and gruel, and the common broth of the house; and when they are weaned, they are, in a manner, totally abandoned. The best management they experience is to be folded in an unsheltered yard, with enough oat and barley straw to keep them from starving; for, from the face of the country and the nature of the soil, there can be but little provision for winter-feeding. This would deteriorate any breed harder than that of the Isle of Mona.

Mr. Boggie, of Beaumaris, assures us, that the better kind of management give their calves three months' milk, either by allowing the calf to suck or to have milk from the pail. After being weaned they are turned into good pasture for the summer, and are well housed at night, and fed in the morning and evening during the first winter. On the following year they fare the hardest of any part of the cattle-stock, being turned on the best pasture in the summer, and foddered on barley and oat straw, and generally in very bleak exposed situations in the winter, for there are few yards in the island. If they are kept another year they are better prepared for the summer, being turned into the next best grass to the cows; if kept over the winter, are generally outlayers, and have hay only at night and morning. Those that get hay are sold in good condition in the spring, and taken to England; those that get straw only are kept until the autumn, when, having had good pasture, they also are got into store condition, and are purchased for the English market.

It is the common opinion, and we fear a true one, that the Anglesey cattle, like that of Glamorgan, is somewhat deteriorated. The state of the case is, that the attention of the Anglesey farmer was formerly strongly directed to the breeding of cattle; copper and cattle were

is the excellence of the breed. Bulls from other districts; but with little good effect. There were two impediments. It was difficult to find another breed sufficiently hardy to the climate and the privations of Mona; and even if such there seemed to have been such an identity between the climate, that little permanent alteration could be accomplished. The first cross effected an evident change, but the Anglesey of the Glamorgans, predominated,—the produce bred back, in a few generations, we had the Anglesey breed again, scarcely, if not, for the worse, by being deprived of a portion of its



[*The Anglesey Ox.*]

The heifer has been crossed with the Lancashire bull, with a view to an increase of size, amounting to at least two scores per quarter, and even an increased propensity to fatten, and that, but, generally speaking, the Angleseys have not improved at least of all from the Irish cattle, which have been bought by the farmers, on account of their being cheaper than any other beasts.

Again improving; the best specimens have been carefully

winter provender, the Anglesey breeders are anxious to get rid of them as soon as they can. Many yearlings cross the bridge of Menai; few beasts are retained in the island after they are three years old. Three-years-old are the most profitable to the English grazier. They are eventually brought to the market from sixty to eighty, and sometimes a hundred stones, and their meat will always bear a superior quality to that of the larger cattle.

In Anglesey, and in the greater part of North Wales, the black oxen were formerly used extensively for the plough, and even on the roads. They were docile and hardy; but their use for draught has now nearly ceased. They are strong, active, and willing; but it might be no disadvantage if they were longer in the leg and less deep in the chest. The Anglesey ox has a peculiarly noble appearance. They were not cut until they were three years old; this gave them a fierce and bull-like form about the head and a projection of the breast, and lofty bearing of the head. There is a stateliness in the gait of an Anglesey ox, and a haughtiness of countenance which we have not recognized in any other breed. It presents a sharp contrast with the mild intelligence of the Devon, and the quiet submission of the Hereford. Early castration, however, is now commonly practiced, and the oxen are getting lighter about the head and dewlap.

Many of the Welsh traditions confirm the early, and indeed the exclusive use of oxen for the plough; and Howell the Good condescended to legislate with regard to these useful animals. The account which he gives of the customary length of the yoke would show, however, that the oxen in those times, were a great deal smaller than we now find them. Six or seven oxen were attached to the plough, (and great strength was derived from their perpendicular manner of forming the ridge, even on the hardest ground,) they were all yoked abreast. The short yoke for two oxen was four Welsh feet, of nine inches each, (three English feet) in length; for four oxen was eight feet (six English feet) long; and that for six oxen was sixteen (twelve English) feet long*. An ordinary ox of the present day would require a somewhat larger space than eighteen feet in order to work, or even to stand.

The oxen were not only smaller, but far less numerous than at present, or the land was divided into much smaller portions. Each circuit of the plough, probably, was influential in the formation of the *Welsh Ploughing Society*, with regard to which, also, the benevolent Howell legislated. Many little farmers clubbed together, according to their means, in

* Wotton's Leg. Wal., p. 284. The old Welsh acre consisted of 4320 square yards, 520 less than the present statute one. The North Wales acre, as now calculated, is of 3240 square yards, being not quite three-quarters of the statute acre.

side of the straits of Menai we find

CARNARVONSHIRE.

th the exception of the promontory of Lleyln at the south-
of it, consists of little more than a succession of abrupt
them swelling into enormous mountains. It may therefore
at the cattle are small. They may be considered as a
ngleseys, but inferior to them in size and shape. Few
rove them have been made, and those attended by no
Both the farmers and the drovers obstinately adhere to
; and certainly with this apology, that no others can vie
diness, or be so cheaply reared.

ntory of Lleyln the surface is more level, and the breed
f Anglesey, but is, perhaps, a little inferior, for the soil is
the pastures so luxuriant. Great numbers of cattle are
district into other parts of Wales, and also into the mid-
England.

ken are here worked, but none in the other parts of the
reme irregularity of the surface and the prejudices of the
ng it. Some good cheese is also made in this part of
t, otherwise, the business of the dairy is completely neg-

MERIONETHSHIRE.

iefly devoted to breeding, is situated south-east of Car-
St. George's Channel from Carnarvon to Cardigan-
most as mountainous as Carnarvon. Here likewise, on
l, the cattle are only a smaller variety of the Angleseys,
to them. They are ill-shaped as well as small, and, in
r. Sharp, of Rhagatt near Corwen, they are some of the

It is the pure Welsh breed, and to which the Merioneth
erto pertinaciously adhered, but it stands at the very
ist, for it has been most disgracefully neglected. The
, however, are capable of material improvement, if atten-
to the selection of the best of the native breed. It is, after
st adapted to the situation and climate, and every attempt
valuable by foreign admixture has uniformly failed.

is found in the vale district, principally devoted to the
siderable quantity of good butter is made in the neigh-
a, and along the whole course of the Dovey. The valley
the richest pasture in the county.

upwards, but are finely made, and of a true yellow colour. There is considerable resemblance to the Devons; but in the grazing districts are chiefly abandoned for the Herefords, which are found to be better adapted to the soil and climate, and much better feeders. Considerable labour is here paid to the dairy, and particularly to the production of milk, which is little inferior to the Cheshire.

The cows, in this division of the county, are not only fair milkers, but the cattle generally show great aptitude to fatten. 'The Rev. Mr. Daines, in his Survey of North Wales, quotes the opinion of 'a grazier of good judgment and great experience,' who prefers the breed of this district, 'they collect bulk on the most valuable parts, and have less of the fatness of those of Shropshire.' About nine months' feeding with grass, and turnips, will add about threescore pounds' weight to each cow in four quarters.

The greater part of this county, and particularly the hills of Kildare and Hopetown are little more than waste land, and employed in the cultivation and pasturing of sheep; on this account cattle are comparatively neglected; but a great many Radnorshire calving heifers used to be brought to the fairs on the borders and kept on straw and turnips until they were sold when the Cheshire drovers bought them for the dairies of the milk-making districts.

Lying north of Merioneth and Montgomeryshire, is

DENBIGHSHIRE.

THIS is a great breeding county; but the cattle are generally, and particularly in the hilly district, of an inferior kind, although resembling the Angleseys. The system of overstocking used to be carried to a great extent here. In the vales, however, we begin to recognize a larger and more valuable breed,—a cross between the Welsh and the longhorn, and prevailing more as we approach the borders of Flintshire. There is considerably attended to in the lowlands, and some excellent cattle are produced there.

FLINTSHIRE.

THIS county is placed at the northern extremity of Wales; and is bounded on the north by the Irish Channel, and on the north-east by the estuary of the river Dee. The cattle here may almost be said to have a purely Welsh character. They most resemble their neighbours in Cheshire and Shropshire, but with many variations. There cannot be any distinct breed; for, from their near connexion with

were so increased in bulk, by the December following, more than double their prime cost.' The quantity of good butter is made in this district, but the dairyman is more devoted to the manufacture of cheese, at all, inferior to the genuine Cheshire. Each cow is to produce nearly three hundred-weight of cheese every year.

SCOTLAND.

There are several distinct and valuable breeds of cattle evidently of the present division, 'The Middle Horns.' THE WEST HIGHLANDER we regard those that are found in the Hebrides, Argyll, seem to retain most of the aboriginal character. They are considered unchanged, or improved only by selection, for many centuries. Indeed from the earliest accounts that we possess of Scot-

HIGHLANDERS are a smaller, coarser, and in every way inferior to those that owe the greater part of what is valuable about them to the Western breed.

THE EASTERN CATTLE were derived from, and bear a strong resemblance to the West Highlander, but are of considerably larger size. They are almost as valuable for the dairy, as for the field, but inferior to few in activity and docility.

THE BREED are second to none as milkers. Many of the best breeds of the *Lowlands* are valuable.

THE DEVONS, which scarcely a century ago were middle-horned, are now greatly distinguished from the West Highlanders, are now a great deal increased in size, with more striking resemblance to their English cousins—with all their aptitude to fatten, and with a hardiness on which the Devons never possessed. All these shall we view before us.

THE WEST HIGHLAND CATTLE.

To describe the cattle of the islands on the Western coast, to say of being, or, at least of retaining the character of the breed is now generally yielded, and whence are procured the best specimens selected to preserve or to improve the breed in other districts.



[*The West Highland Bull.*]

SKIRTING the coast, from the promontory of Cantire to the northern extremity of Scotland, is a range of islands appearing like so many fragments torn off from the main land—these are the Hebrides, or Hebrides, nearly two hundred in number, and about half of them inhabited. They may be conveniently divided into two groups, the inner and outer; the inner consisting of the larger islands, and some of them separated from the main land by narrow channels only; the outer being thirty or forty miles farther from shore.

Little is known of the history of the Hebudans, except that they descended from the same stock with the Irish and the Highlanders, but were oftener exposed to the incursions of roving tribes from the north-western quarter, and who successively mingled with, and were lost among them, never superseding the original inhabitants. If we are to credit the current testimony of many old legends, and confirmed by the remains of ancient pillars, and castles, and fortifications, which are still to be seen on the islands yet present, the Hebudans of early times were powerful and civilized. ‘The kingdom of the Innsegallians was the pride of the island and the terror of its foes.’*

Sir Walter Scott says, that ‘in Malcolm’s reign (Malcolm IV.) the Lords of the Hebridean islands, scarcely acknowledging even a nominal allegiance either to the crown of Scotland or that of Norway, claimed by both countries, began to give much annoyance to the coasts of Scotland, to which their light-armed galleys or *birlins*, and their habits of piracy, gave great facilities.’† ‘Alexander II. died in the island of Kerrera in the Hebrides, while engaged in an expedition to compel the island chiefs to transfer to the Scottish king a tribute which some of them had paid to Norway.’‡ In 1263 all the Hebridean Islands were annexed to the Scottish crown under Alexander III.§

The occupation and character of the Hebudans does not appear

* Macdonald’s Scandena.

† History of Scotland, (Lardner’s Cabinet Cyclopaedia,) vol. i. p. 34.

‡ Ibid., p. 43.

§ Ibid., p. 47.

the agriculturists. These cattle, which had been totally
their value altogether unknown, retained their primitive
Hebudans for the first time became aware of this, and
in greater numbers, and a few of the most intelligent
tried to improve them by selections from the best speci-
fied stock: the result has been, that the breeds of some
now bear the highest price among the Highland cattle.
It is supposed that in a group of islands extending nearly two
degrees from north to south, there will be considerable difference
in the value of the breed; but through the whole of them
the inferiorities of the Highland cattle are sufficiently evident,
they have been debased by the admixture of Irish blood.
The difference is in the size, and there the cattle of the southern-
ers claim the superiority. This island is sheltered by its
from the storms to which most of the others are exposed, and
is better; the cattle are therefore earlier ready for the
market at a greater weight. It is not, however, certain that this
would be of advantage on the northern islands, or
inland;—the cattle, deprived of a portion of their
strength, not be proof against the inclemency of the weather,
on such scanty forage as the Highlands in general
afford. The breeders are so much aware of this, that they endeavour to
improve the quality and value of their stock, by selecting, not from the
largest size has increased, but, by almost general consent, from
those where the cattle are small, *but are suited to the soil and
climate, and can be most easily and securely raised at the least
expense, and removed to better provender, will thrive with a rapidity*

the term Kyloe is obscure. Some writers, and among
them Sinclair, have curiously traced it to their crossing the
ferries which abound in the West of Scotland; others,
of propriety, and one of whom is Mr. Macdonald, the author
of the Highlands, tells us, that it is a corruption of the

The agriculturist, Adam Ferguson, Esq., of Woodhill, expresses a similar
opinion in his Essay on Crossing, contained in the First Number of the Quar-
terly Review. 'I cannot but regard the West Highlanders, or, rather,
the Highlanders, as more valuable than any other breed we possess in Scotland, excepting, it
may be said, the aborigines in the park of his Grace the Duke of Hamilton.
The mild winter, and, consequently, grassy tendency of our Western
climate, but as having been, in all likelihood, early stocked with the Boves
of a hardy and healthy constitution; and the little intercourse for commercial
purposes inland during many ages, gave a permanence to their individuality
elsewhere.

to leave but little hollow behind them. The girth behind the deep; the back straight, wide, and flat; the ribs broad; between them and the hips small; the belly not sinking low in yet, in the whole, not forming the round and barrel-like carcass some have described. The thigh tapering to the hock-joint, larger in proportion to the size than in the breeds of the south. The tail set on a level with the back. The legs short and straight. The whole carcase covered with a thick long coat of hair, and plenty also about the face and horns, and that hair not curly.

The value of the West Highland cattle consists in their being hardy and easily fed; in that they will live, and sometimes thrive, on the poorest pastures; that they will frequently gain from a fourth to a third of their original weight in six months' good feeding; that the proportion of bone is not greater than in the most improved larger breeds; that their flesh and fat equably on the best parts; and that, when the skin is closed fine in the grain, highly flavoured, and so well mixed with fat that it commands a superior price in every market.

The different islands of the Hebrides contain about one hundred and fifty thousand of these cattle, of which it is calculated that thirty thousand are sent annually to the main land, principally through Jura from the ferry of the Isle of Skye. If these average about 5*l.* per head, the amount will be 150,000*l.*, or more than the rental of the whole of the islands, which Mr. Macdonald calculated at 106,720*l.*, but which actually produces a greater sum. Cattle, therefore, constitute the staple of the Hebrides. Three thousand five hundred are annually exported from the island of Islay alone.

Mr. Moorhouse, from Craven, in Yorkshire, in 1763, was the first Englishman who came into the Hebrides to buy cattle. In the absence of his husband, Mr. M'Donald, of Kingsburgh, he was kindly entertained by Flora M'Donald, who made up for him the same bed that, several years before, had received the unfortunate Prince Charles.

From Skye Mr. Moorhouse went to Raasay, whither, in 1764, Mr. Kingsburgh followed him; and, during a walk in the garden on the evening of the harvest, they bargained for one thousand cattle, at two *l.* per head, to be delivered free of expense at Falkirk. Two days before they had bought six hundred from Mr. M'Leod, of Waterside, at 2*l.* 5*s.*

Forty years ago the treatment of cattle was, with very few exceptions, absurd and ruinous, to a strange degree, through the whole of the Highlands. With the exception of the milch cows, but not even of the calves, all wintered in the field: if they were scantily fed with hay, they starved, and withered, and half-rotten; or if they got a little straw, they were thought to be well taken care of. The majority got little more

used during the winter, but among the small farmers it is in a singular way—for one rude dwelling contained the family and the cattle. The family had their beds of the niches of the walls, while the litter was never removed and fresh layers of straw were occasionally laid down, and with the accumulation of dung and litter, until the spring it was upon the land, when it was at length taken away*. of the climate and the want of inclosed lands, and the thought in the farmer, were the chief causes of this winter starvation. The rapidity of vegetation in the spring is astonishing in these islands. A good pasture in a fortnight without growing high and rank; and even marshy and heathy grounds are comparatively luxuriant. The farmer fully stocked, or overstocked,

He crowded his fields at the rate of six or eight sheep to an acre. From their natural aptitude to fatten they were in good condition, but not such as they might have attained, for the salesman or the butcher. Winter, however, succeeded: no provision had been made for it, except for the sheep that were not properly fed even in the summer, and perished in the winter†.

However, have partaken of that improvement in agriculture which we shall have frequently to speak when describing the different parts of Scotland. In the island of Islay, the greater part of the property of Walter F. Campbell, Esq., and to whom we are indebted for valuable information, the following is the general system among the better kind of farmers, and the account will apply generally, and to Argyleshire.

As ‘Tour through the Highlands,’ gives a sadder account of the poverty of the same hut, by the peasant and his cattle, in the Island of Skye, speaking of the privations of the peasant, he adds—‘Nor are his resources: in summer they pick up a scanty support among the morasses but in winter, when the ground is covered with snow, and when they have neither shelter nor subsistence, the few cows, small, lean, and want of pasture, are brought into the hut where the family resides, with them their little stock of meal which had been purchased or brewed; while the cattle thus sustained, are bled occasionally to afford the children after the mingled oatmeal and blood has been boiled or

As Account of the Hebrides, gives a very curious statement of the disproportion between the stock and the rent of a farm; a disproportion which must be ever low the rental may be. ‘A farm in Kintail was found to have which with their young stock, from a calf to a four-year old, made little; besides 80 ewes and 40 goats, which, with their young, were the principal resources. Yet this farm, with arable land sufficient to supply all the family, was let at twenty pounds a year.’

Lowland districts, whence they gradually find their way to the southern counties of England.

The calves are housed in the beginning of November, and fed on hay and roots (for the raising of which the soil and admirably adapted) until the month of May. When there keep, the breeding cows are housed in November, but in general kept out until three or four weeks before calving. In May the cattle are turned out to pasture, and, if it is practicable, those of different ages are kept separate; while, by shifting the cattle, the pasture is kept as much as possible in eatable condition, that is, neither eaten nor allowed to get too rank, or to run into seed.

In the winter and the spring all the cattle except the breeders are fed in the fields, the grass of which is preserved from the 12th of October to the end of October. When these inclosures become bare, at the end of December, a little hay is taken into the field with turnips, and fed once or twice in the day, according to circumstances, until the end of April. Few only of the farmers have these roots to give to the cattle. The feeding of the out-lying cattle with straw is quite abolished. Those of them, however, are very materially out of condition, they are like oats in the sheaf. At two, or three, or four years old, all, except those that are retained for breeding, are sent to market.

There is little or no variety of breeds of cattle in the Hebrides; they are pure West Highlanders. Indeed, it is the belief of the farmer, that no other breed of cattle will thrive on these islands. The Kyloes could not possibly be improved by being crossed with others. He appeals to his uniform experience, and most of the Hebrides, that attempts at crossing have only destroyed the quality of the Kyloes, and rendered them more delicate, and less suited to the climate and the pasture.

By selection from the choicest of the stock, however, the West Highlander has been materially improved. The Islay, the Isle of Mull, and the Argyleshire beast, readily obtains a considerably higher price than other cattle reared in the Highlands of Scotland. Mr. M'Nicol is eminently successful in his attempts to improve the native breed. He has often obtained 100*l.* for three and four-year-old bulls out of his own stock; for one bull he received 200*l.* He never breeds from bulls less than three years, or more than ten years old; and he disapproves, and rejects, the system of breeding in and in. He also adds to the golden rule of breeding, the careful selection of the female; and it is not a small sum that would induce the Hebridean farmer to sell any of his picked cows.

It is true that grazing has never been the principal object of the Hebridean farmer, or has scarcely been deemed worthy of his attention.

sold at Greenock or Liverpool at			
ne *. This would amount to	£6687	0	0
pose that the same cattle,			
or May to the drovers,			
etched 4l. 15s. per head ;			
course of six months, at			
en would have been lost			
accident, we will say that			
ad then 1000 cattle at			
ting to	£4,750	0	0
s let at 12s. per head for			
hs, making	600	0	0
looking after, at 2s. per			
.	100	0	0
t 8s. each	360	0	0
et, 5s. each	225	0	0
l. for six months	148	6	0
Total expenses	6,183	6	0

Balance in favour of fattening . £503 14 0

cent. ; and this average is taken very low, for the
gh more than 20 stones per head.

to suppose that the Hebridean farmer best knows his
s may deserve consideration.

l from what we have said of the milking properties
dairy is considered as a matter of little consequence
the farmer rarely keeps more milch cows than will
h milk and butter and cheese. The Highland cow
an a third part of the milk that is obtained from the
reat distance on the main land ; but that milk is ex-
e butter procured from it is excellent. In Arran and
f Clyde, the Ayrshire cow was partially introduced
g coast, but in the other islands of the Hebrides, the
stinately retained. In North Uist and Tiree the
sfully followed than in the other islands, partly on

ern islands, and particularly in Collonsay and Islay, the pure
ly fattened to from 34 to 42 stones Imperial. Mr. Campbell,
which, when slaughtered, weighed 63 stones ; but among the
bullock of fair size will weigh about 33 stones, and a heifer
er in the southern islands than they are in Skye, for the pasture
be raised to a still greater size, were it not for the shameful
which we shall have so often to allude.

more than two or three inches in depth. The cream is supplied more rapidly in these shallow vessels; and it is removed in the eighteen hours. A cow will not, on the average, yield more of butter (of 24 oz. each) in the summer season: she will yield 90 lbs. of cheese, which is much liked by some on account of the flavour which is given to it by the mixture of rose-leaves, cinnamon cloves, and lemon with the rennet *.

Oxen are never used for the plough or on the road on the Hebrides.

We have stated that more than 20,000 of the Hebridean cattle are conveyed to the mainland, some of whom find their way even to the most counties of England; but like the other Highland cattle the journey is usually slow and interrupted. Their first resting-place is some way from the coast, for they are frequently wintered on the moorlands of Dumbartonshire; and in the next summer, after grazing on the lower grounds, they are driven farther south, where they are kept during the second winter on turnips and hay. In April they are in good condition, and prepared for the early grass, on which they are put.

Many of these small cattle are permanently arrested in the islands and kept on low farms to consume the coarse grass, which the cows refuse to eat; these are finished off on turnips, which are given in the field about the end of Autumn, and they are sold about Christmas.

In the Outer Hebrides, principally separated from the inner by the channel called the Minsh, and, from the apparent continuity of the range of the islands, and the hills all running in the same direction, the Long Island, there is but little improvement in agriculture; the pasturage is quite equal to the generality of that in the inner islands, but the cattle are of somewhat more diminutive size. Mr. Macgillivray, in his 'Prize Essay on the present State of the Outer Hebrides,' says that the black cattle are small, but well proportioned; and on the tacks (a tacksman is one who has a large tract of land, which he lets by lease) they are generally of good breed, and, although not

* Martin, in his account of the Western Isles of Scotland, sixty years ago, mentions a superstition which then prevailed: 'It is a received opinion in these islands that the cows, by a charm, or some other secret way, are able to convey the increase of the cows' milk to their own use: and that the milk so charmed does not produce a large quantity of butter, and the curds made of that milk are so tough that it cannot be pressed firm as other cheese, and is also much lighter in weight. The butter so taken is joined to the charmer's butter, is evidently discernible by a mark of separation, and diversity of colours; that which is charmed being still paler than that part which hath not been charmed; and if butter having these marks be found with a woman, she is directly said to be guilty. Their usual way of recovering the milk is to take a little of the rennet from all the suspected persons, and put it in an earthen milk, and when that from the charmer is mingled with it, it curdles, and no



[*The West Highland Cow.*]

are covered with a thick and long pile during winter. A good pile is considered one of the essential qualifications. The most common colours are black, red, brown, or a mixture of red and brown with stripes—*brindled*). It is also pretty frequently seen, not unlike that of the cow of Scotland, both the horned breed at Chillingham, and at Hamilton; and it is remarked, that in all their traits, what are called fairy-cattle, this is the colour ascribed. The breed of black cattle has been greatly improved by the importation of bulls and cows from various parts of the

On farms the cattle are not housed in winter, excepting those belonging to the cottars generally are. In summer the sheep are sent to the inland glens and moors, which afford grasses and rushes, because the portion that yields is sufficient for their consumption during the whole year. By a woman from each family, who has a small hut or habitation, and who makes the little butter and cheese which milk affords. The cows are thus kept in good pasture part of the summer and autumn, when the young beasts are born. Towards the winter all the cattle are brought to the farms, the stirks are separated and housed at night. They live exclusively on hay and straw, portions of which are distributed to the cattle during snow.

Small tenants are all housed at night during the winter on straw, hay, and the refuse of the family meals. These people are usually divided into three apartments. One occupies half of the hut, is the general entrance, and is used for agricultural implements, poultry, and cattle. The second, the other half of the hut, is that in which the family reside; and the third, of the same size, is the sleeping room and granary. There are no chimneys, and smoke fills the whole hut, and escapes partly by a hole

which and spring regularly betake themselves to the sea-shore at low tide to feed upon the fuci.

The milk of the cows is said to be excellent, but on account of the habits of too many of the cotters, the butter and cheese are eaten by the natives.

Having described so much at length the cattle of the inner Hebrides, we shall be able to pass with considerable rapidity to the other districts of the Highlands.

ARRAN AND BUTE.

THESE islands are separated from the other Hebrides by the Firth of Clyde, and are situated in the Firth of Clyde, between Argyllshire and Ayrshire, and form a county under the name of Bute.

Almost the whole of ARRAN is the property of the Duke of Argyll and Brandon, who kindly granted us every facility for becoming acquainted with the cattle of the island, and to whose very intelligent agent, Mr. Paterson, we are indebted for much valuable information.

Seventeen years ago Arran was overrun by cattle of almost every breed and character. The West Highland was probably the most common, but many had been imported from Ireland, as the situation of Arran would lead us to suspect; and more had been introduced from Gallogalloway. The Earls of Carrick were formerly the proprietors of this district; and in an early period, and, even before the time of Robert I., they had introduced many cattle from their mainland estates into Arran, which was then little better than a mere hunting-ground. These breeds were mingled in every possible way, but all of them were small, narrow in the loins, long legged, and thin in the hams; their form was square and angular, and the skin coarse, yet with little hair; they were generally brown, but generally with white intermingled, frequently with white about the neck and almost invariably with white about the belly.

They yielded very little milk, although that which they did give was good; and, in the property of fattening, they were far inferior to the cattle of the other islands which we have just described. In fact, the whole of husbandry was wretched. Each farm was strangely let to various tenants, who occupied in common or in *runridge*, *i. e.*, one of the ten occupied one ridge, and a copartner the next, and so on; and the area of the farm was divided into numerous small lots, which were yearly let to different persons, and almost yearly changed*. No improvement could

* One of the oldest arrangements of the great proprietors of land was to let the whole tenantry or vassalage as nearly as possible around their own manor. The neighbouring grounds were then divided into fields of various extent.

inter but oat-straw.

called the *head-dykes*, i. e., rude banks to separate the or pasture land, the cattle and sheep and horses ranged whole island; and the farmer, who, for generation after en taught to believe that his riches consisted in the le, instead of their individual worth, not only sent more summer than they could well maintain, but reserved far ossibly be kept in the winter. The number of cattle far e inhabitants: a great many of them were carried off by ase; and the remainder were found in the spring in a provincially termed 'lifting;' they were declining in l points were fast leaving them.

milton beheld this with much regret, and, with a zeal at of the agriculture of the island, which reflects on dit, and which is the best direction that true patriotism himself heartily to work, not only to ameliorate the breed orm and change the general system of husbandry.

arly the whole of the island terminated in 1814. The his fine property in Arran should be surveyed. He nct and separate farms of different dimensions, from e former tenants in common, to more than three or

He brought much of the waste land into cultivation excavated drains to the extent of 120 miles in length;

the soil; and again subdivided into parcels or ridges of equal size, number of the retainers: and one of the rigs or ridges was let or t was thought that all would thus have an equal share of the good out partiality or preference, although each one's *possession* (the probably be dispersed over a dozen places. This system of occu- d *runrig*, or *runridge*. Besides this general practice of having as customary in some places for the tenantry to exchange their year; so that, in a given course of years, each tenant would have hole of the ridges. This was called *coup-rig*, or *change-rig*. A inconsistent with good cultivation can scarcely be imagined.

rable lands into *infield* and *outfield*, was universal in Scotland, and e *infield*, as stated in the text, got all the dung produced on the der a constant rotation of crops. Lime and fallow and artificial

. The *outfield* bore three crops of oats, and, if it was more than : crops, and then lay idle for five or six years. The consequence n forty years ago, the produce of every land was little in quantity e horses were fed in summer almost entirely on thistles, which l grew too plentifully in the *infield*; and the owner of a little field cultivation, now produces ninety bushels of oats yearly, told the he sometimes had 1200 sheaves upon it, he would have given the single bushel of meal. He had straw for the winter feed of his ight starve.—See *Robertson's Rural Recollections*, p. 263.

more than doubled in value, and his tenantry are more prosperous and happy.

The Duke of Hamilton immediately introduced some choice pensive bulls from the stock of the Duke of Argyle, in order to improve the wretched breed of cattle; but they were found at first to be too small for crossing the small cattle of Arran with perfect effect. Some bulls of the dairy breed were brought from Ayrshire, but they did not combine with the old stock of the island; their skins and hair were too thin for the bleak hills of Arran; and this cross was soon abandoned as a breeding stock. Some farmers, however, again had recourse to Argyle bulls, for the breed had evidently improved, at least on the farms, and a spirit of emulation was beginning to be excited.

In consequence of this, several bulls of the Argyleshire sort were purchased by the duke in the summer of 1822, and placed in various parts of the country for the use of the tenants. The effect was now immediate and palpable; and every year, and at very considerable expense, two or three fresh bulls were imported, and scattered in the most convenient places throughout the island; and, as far as influence and persuasion could go, the old breed was systematically discouraged.

The improvement was rapid and progressive. The Arran cattle are now black or brown, and horned, and in most parts of the island still retain somewhat of the form of the original stock. This is most evident in the smallness of the limbs, the thinness of the neck, and the shortness of the hair. On the farms, however, of more careful breeders, the difference between the Arran and Argyleshire beasts can scarcely be observed, and that difference is yearly decreasing. The Arran improved blacks are gentle-tempered, and kindly feeders; but better adapted for the plough than the dairy.

The Arran beasts used to be scarcely saleable; the southern farmers would not have them at any price: but in 1832 the stots of three years were sold in great numbers at ten pounds each after having been fed on grass alone, and queys at more than nine pounds. Cattle-husbandry has lately improved through the whole of Scotland; and in many of the districts the character of the breed is essentially changed, but no where has so much been done in a few years to ameliorate the stock, and better the condition of the tenantry. Twelve or fourteen years ago, the average weight of an aged Arran cow, when fed on grass, did not exceed eighteen or twenty stones: she would now be at least three or four stones heavier, and the oxen have reached forty-five or fifty stones.

The calves, which are generally dropped in spring, are not suffered to suck the dam, but are fed on milk for about six weeks. Two months

the yearlings are sent to the mills, generally at no great distance from the dwelling; and, for the most part, they remain out until all the cattle, young and old, are housed during the winter. In the house they get straw-fodder, with sometimes a little turnips. The cattle are occasionally indulged with potatoes or a few of these; and this is added coarse, strong-growing, green kale, which is very small farmer's garden for this purpose. This practice, to Arran, is practised there to a greater extent than in the other districts. The cattle calving in the winter, or early in the spring, are fed with kale, potatoes, and straw. Both the kale and potatoes are usually boiled, and sometimes the chaff; and the milch-cows are fed with meal before calving, and sometimes for a little while afterwards, or meal boiled with their other provender. Notwithstanding the use of the kale, the Arran cattle are not too well fed in the winter; the growth of the young beasts is often materially stinted by it. When the weather is not stormy, the cattle are driven out during the day—the young ones to the hills, and the older ones to the low pastures and stubbles.

The practice of housing at night is, in some instances, necessary on account of the exposed and shelterless situation of the farms; but, in other instances, it may, with advantage, be dispensed with, especially with regard to the young cattle; for it makes them tender, it prevents the growth of the thick soft hair which nature provides as a protection against the chilling blast, and it renders the beasts more liable to hoarse voices, when they must afterwards be exposed to no little cold in the open grass.

Most of the cattle of Arran are sold in the autumn, from two to three years old. They are transported to the mainland, and afterwards by the way of Dumfries, where they are fed on grass for some time, and thus generally well prepared for the butcher: a few calves are annually sold at the same time from farms on which they have been reared. The greater part of Arran is a dairying district; but on a few farms the cattle are fattened so successfully as to render it probable that the practice is generally pursued with considerable advantage. Some of the cows, when beginning to fail in milk, are fed off in the winter on turnips, either for home consumption or to be sold to the butcher in the spring. About 800 head of cattle are yearly sent to the mainland from Arran.

The cows are housed at night, even in the summer; they are driven out in the evening for milking, after which they get cut grass

We have dwelt the longer on the cattle husbandry of this highland because it is a splendid example of what may be effected, in a few years, by the exertions of one patriotic individual.

The circumstances which, until the last eighty years, caused the agriculturists to be so far behind their brethren in England, were the continuance of the feudal system, and consequent vassalage in the highland kingdom. Short leases alone were granted, frequently of not more than a twelvemonth; a great part of the rent was demanded in kind, and the tenant was harassed by the exaction of continual services in every oppressive manner. But when services were abolished, and a fixed rent in money was established, and, by the length of the lease, security was given to the tenant that he should reap the fruits of his improvement, he began to set himself thoroughly to work. The rapidity of his improvement may be seen in the north, for by circumstances which fall not to the lot of the southern agriculturist—tithes had been annihilated in Scotland, at least so far as the highland was concerned, and the burden of supporting the poor was scarcely felt.

The Isle of BUTE, in Gaelic, signifying 'a bold furious headland,' is so called from the rugged rocks on the southern extremity, while the interior itself is comparatively flat, is higher up the Firth. It is about 15 miles in length, and three in breadth, and contains 24,000 Scotch acres of ground. The title of Duke is given to the heir-apparent of the British Crown; and was formerly the residence of some of the Scottish monarchs. The castle, a noble ruin, is still to be seen. Agriculture was at a lower ebb in this island than in Arran, but it somewhat earlier began to emerge from its degraded state. The Marquis of Bute was induced, by the illness of his lady, to reside two years on the island. He had a full demonstration of the lamentable condition of his estates, and of the want of interest generally, and interest and patriotism induced him to endeavour to improve their improvement. He enclosed many of the farms. This was a necessary step, and without which everything else would have been of no avail. He introduced the system of draining, fallowing, liming, &c., and much was effected; but the attention of the Marquis being completely occupied at court, all was not accomplished that he wished; and the island, though improved, continues to rank low in the scale of agricultural improvement. The cattle were small. The farms were overstocked with them. There was little sown grass, and no green food for winter; and until the farms were better covered than formerly, all attempts materially to improve the value of the breed would necessarily fail. With the advancement of agriculture generally the cattle have increased in value, although they are still of a motley character; and they are beginning to have considerably more of the Ayrshire breed in them than is to be found in Arran.

system of sheep-husbandry has been introduced into rearing there, yet, including every kind, there are supplied 65,000 black cattle in the county. John Campbell, Ayrshire, was the first who stocked a farm with sheep the year 1760, in the united parishes of Lochgoil Head. The country-people regarded him at first with an evil opinion of sheep-husbandry is now acknowledged in all districts of Scotland.

Argyle cattle are larger than the Hebrideans, and are of full size which the soil, or the best qualities of the food. That fundamental principle of breeding is generally that the size must be determined by the soil and the food; it is more profitable to the farmer to have the size of his cattle rather than over, the produce of his land. Both will graze themselves to the soil; but the small beast will become more improve in all his points—the large one will degenerate of very good quality. Therefore, the soil and management generally speaking, better than that of the Hebrides, it is somewhat larger animal might be admitted; he was, indeed, not by crossing with a breed of superior size, but by selecting from the best of the pure breed. Experience and judgment are required when the proper point—the profitable weight—was reached; the farmer went back to the equally pure, but smaller breed, lest the form should be deteriorated, and the fattening power unequal and true, and the meat should lose some of its richness and flavour.

Part of the Highlands where the soil and the climate are not to the perfection of the breed than in Argyle, or where we find the characteristics of the best Highland cattle—short, and round in the shank, round in the body, straight in the back, straight in the muzzle, and with a well-turned and rather small head. No district in which the farmer so superstitiously, and yet so liberally, refrains from foreign admixture. Could the two great evils of the Highland farmer be remedied, but which are found to be the cause of his poverty, overstocking in the summer and starving in the winter, it would be nothing more to desire, so far as the grazier is concerned, perhaps, docility of temper; and that will be gradually effected by further improvements in agriculture have rendered it unnecessary to wander so far, and over so wild a country, in order to find him, and when he will be earlier and more perfectly domesti-

is sometimes allowed the milk of two cows for a considerable often for six months. When the calves are weaned, they are f hills during the summer, and brought on the lower grounds and if the pasture is not good, they are occasionally fed with hay. It is after the first winter that the absurd and cruel syste stocking and starving commences. From the superiority o however, this is not carried to the ruinous extent that it Hebrides. In favourable situations, some farmers winter their open sheds, where they are fed with hay in the racks. This m hardier, and does not cripple their growth.

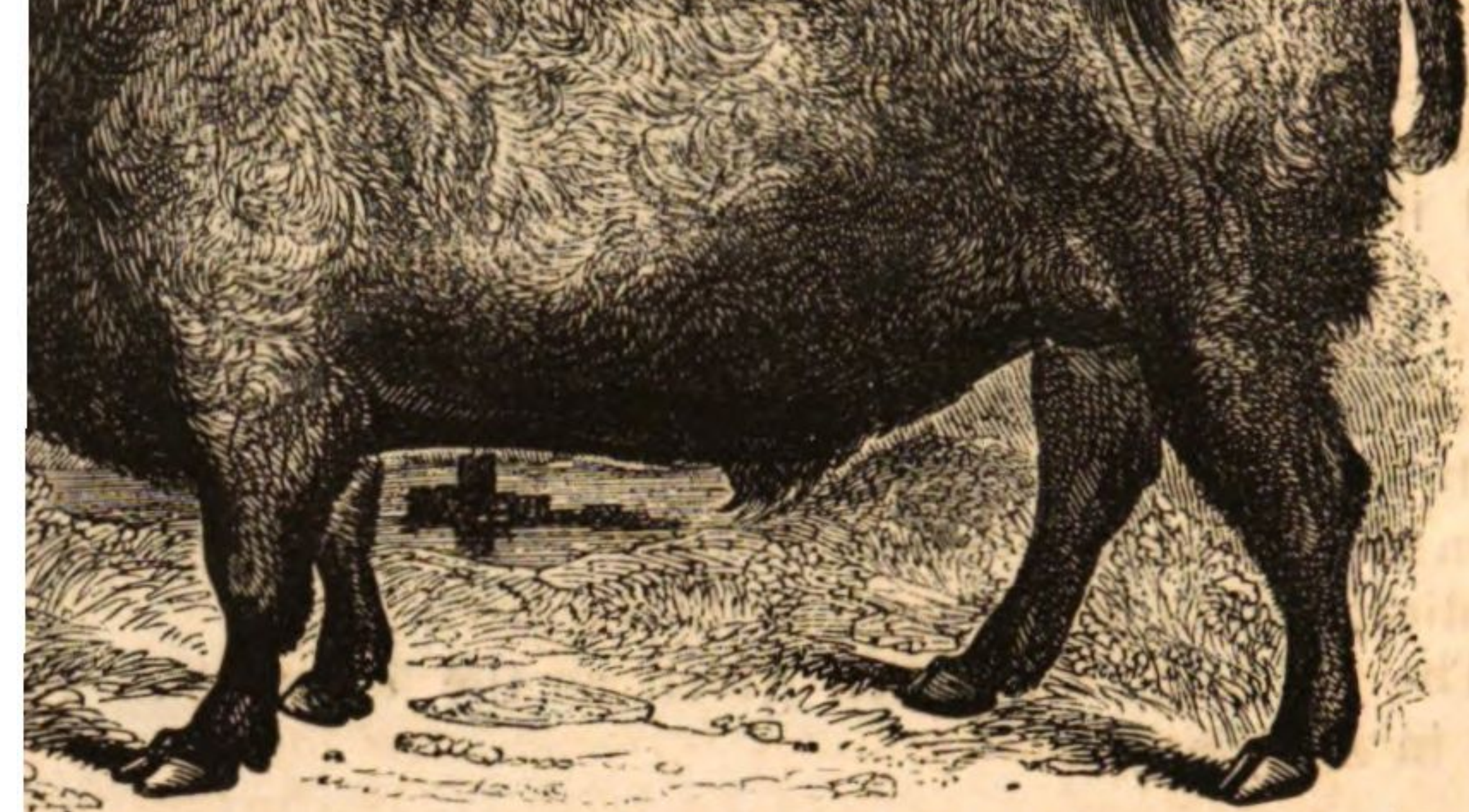
The following has been given as the expense of rearing a stot in Argyleshire:—

To milk to the calf while sucking, $1\frac{1}{2}$ Scotch pints per day, at 2 <i>d.</i> per pint	£ 2
To expense of keeping the calf housed and fed on straw and hay during the first winter, 12 <i>s.</i> —but deducting 3 <i>s.</i> for manure, there remains	0
To pasture next summer on hill grass	0
To keeping next winter on low grounds, and feeding in the fields with hay when necessary	0
To pasture on hilly ground next summer, being then $2\frac{1}{2}$ years old	0
Deduct for risk of deaths	0
Interest of money	0
	£ 4

Supposing that they then sell for five guineas at first hand average price will not much exceed this—the profit will be b This and the increased price of corn will sufficiently account gradual substitution of sheep for cattle on the greater part of the country of Scotland.

The Argyleshire farmer is sometimes wrong in breeding from a cow too long. Although the Highlanders fatten rapidly for time, and begin early to fatten where the pasturage will give the tunity to show it, they do not thrive so well when old. A cow destined for the drover should not be permitted to breed after old. She may make fair meat for home consumption, but sh fatten so quickly, or so truly, and on all her points; and, in drover will seldom purchase her except at a very inferior price.

It is now also established as a principle among them, that



[*The Argyle Ox.*]

e in Cantire, or the south of Argyle, are of a thinner, not well haired: they are evidently of Highland breed. They show much crossing with Irish blood. They are bred for the pasturage which they find, and are fair milkers; but was always more attended to than rearing in the district. The Ayrshire cow has, however, nearly superseded the only one in Cantire, but through the whole of Argyleshire, for the dairy. She is promising to spread as rapidly and in the middle and northern parts of Scotland as the short-horn in the whole of the eastern part of England. A few others were tried, but with doubtful success. The West Highland is universally adopted for grazing farms, and the Ayrshire only for the dairy. The butter is good, except that it is brittle, however, can be said in favour of the cheese. The cheese is often more in fault than the milk or the Cantire he usually keeps his milk forty-eight hours, in which time all the cream, and before the expiration of that time it is rancid and becoming sour; curds of different ages are also used, and which will not amalgamate and form one uniform mass.

is found in Argyle, and particularly in the southern part; but they are not equal to the native Highlanders. Sometimes they have been crossed with the Galloways, to give them more strength; but the experiment has not succeeded: they have not improved so quickly, nor so equably.

the other round the jaw and under the tongue of the next ; and are thus connected together until there is a string of six or seven. At the time of high water is chosen, when, although the passage is less current. The beasts are led into the water as quietly as possible until they are afloat, when they immediately cease to resist, and at the stern of the ferry-boat taking hold of the rope that holds the most beasts, the vessel is rowed steadily across, and the cattle pass out without a struggle. It is very rarely that one of them is lost.

The cattle, at least in Lochaber, and along the western coast of Ross, and on the borders of Ross, are essentially the same as those of the north of Argyle, and their treatment, with all its faults, the same as in the central parts of the county, however, the breed is mixed, and varies with the Galloway, or Fife, or Irish. On the borders of Moray is still a different breed, the origin of which it is difficult to trace ; but the Highlanders ; better milkers ; but not so profitable for the farmer. It is said that they were first bred of this superior size to make them strong enough for the yoke, but at present the ox is never used except in the plough or on the road. So late, however, as the year 1791, Mr. Smith, in his statistical account of the parish of Petty on the Moray, says, that ' 1400 oxen were employed in that neighbourhood for agricultural work.' He adds, that ' they were of the light nimble Highland breed, and, when unfit for work, disposed of to the dealers in the English markets.' Few of them, however, were reared in the parish, but were brought from the Highlands when young.

The system of summer feeding, or '*going to shealings*', as Mr. Smith has described as occasionally followed in the Hebrides, is still in use in Inverness ; but, as agriculture has improved, and sheep have been introduced, these rights of pasturing on the distant wastes have been given to the shepherds, who live on them all the year.*

Dr. Robertson, in his '*Survey of Inverness*,' gives the following description of 'the shealings :—' After the crops had been sown, and the corn cut, the inhabitants removed annually, in the month of June, to the distant pastures, with all their cattle and families ; and the cattle were put in a snug spot, the best sheltered in all the range allotted to the parish.

* It is mentioned in Sir John Sinclair's '*Statistical Account of Scotland*' that in the parish of Laagan, in the mountainous country to the south-west of Inverness, that the number of cattle had considerably decreased in that district ; ' people have found it more profitable to reduce their stock of black cattle, and increase their stock of sheep. But the cattle that remain are very much improved. Twenty years ago (1771) a black land stot was not worth more than 20*l.* Scots, whereas it will now sell for 40*l.* or 50*l.* ; and milch cows have risen in value from 3*l.* 10*s.* to 5*l.* or 6*l.*' Black cattle, however, may still be considered as the staple riches of Inverness, and on which the farmers depend to enable them to pay their rents.

res were unusually rich, as at the head of a lake or by
s in the valleys, the inhabitants of two or more farms
, and ate the grass of their *shealings* in common. This
contentment and often of festivity. The women em-
in spinning wool to clothe their families, and in making
for part of their winter provisions†; and the youths
s in fishing or athletic exercises; and at evening the
f dancing on the green and singing Gaelic songs was
e shealings lasted from one to two months or more,
sture was all consumed they returned to their home-

M'Lean, in an Appendix to this Survey, has some
healings, the importance of which has been acknow-
rness farmers, and the most valuable part of what he
been adopted. He is speaking of the system of over-
and even on these shealings. He says that, 'on every
is kept. If the cattle are brought through the winter,
sufficient; and after a severe winter they appear in a
ght, and those of them intended for sale are seldom fit
re the end of the summer;' and, he asks, 'is there not
e?—is there not more profit from one beast well, than
indifferently kept?' He, therefore, submitted to the
lture 'to give premiums to those who shall have their
k cattle in the best order in the month of May, or who,
l have the beasts intended for sale in the best market-
n emulation of this kind would prove an incitement to
turnips and sown grass, as, without these, it is not easy

ord, which signifies a *deer-forest*: these shealings, therefore, were
made by the inhabitants and their cattle on the territories of the
t full possession of the *straths*, or lower vallies.

s 'Highland Superstitions,' tells us that great virtue was once sup-
e of this cheese, but the difficulty which attended the manufacture
its value. He says, 'you must go to the summit of some steep
the feet of quadrupeds never trod, and gather that herb in the
"mohan," which can be pointed out by any "wise person." This
the cow; and of the milk of the cow you are to make a cheese, and
heese is for ever after perfectly secure from every species of fairy

mmer, in his Statistical Account of Walls in the Orkneys, says of
eir household furniture must be described negatively. No bed,
ese the Highlander does not reckon among the necessities of life,
rth serve him for all the three. In his shealing, composed of earth
ind no other furniture than a few dishes for his milk, and a bowl
n fact, as well as in philosophy, is the maxim, "nature is content

45,000 head of cattle. These *trysts* are not fairs or markets by public authority, but by concert among the dealers. The conducting them is very curious. When the drovers from the north from the interior of Scotland, make their appearance in the south about the latter end of April or the beginning of May, they go to the churches that, on a particular day, and at some central district, they will be ready to purchase.

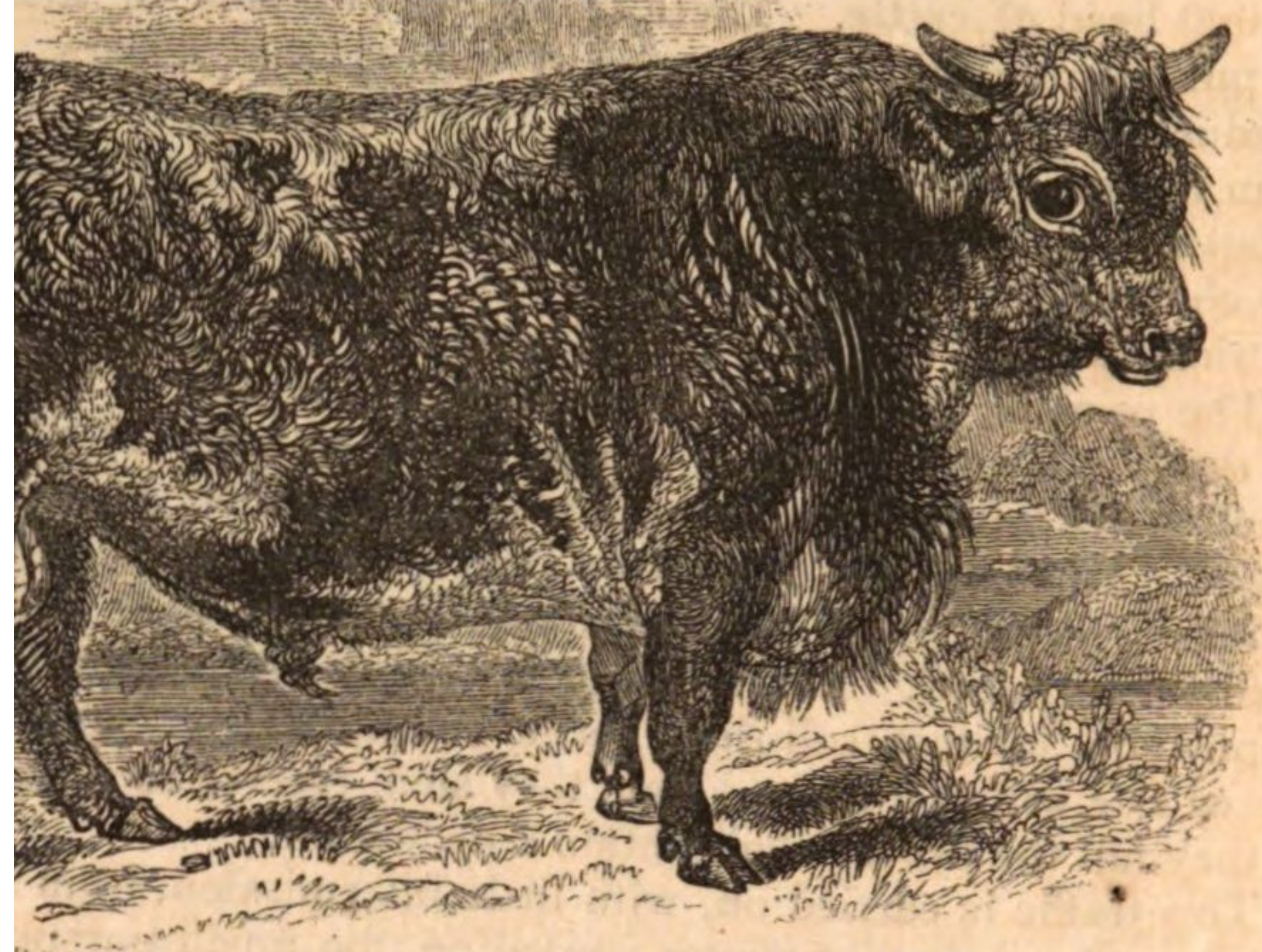
The price is, like that of everything else, regulated by the supply. Of this the farmers can only judge by the number of the drovers and the intelligence which they have received from their correspondents in the south. Much address is used on both sides to feel the pulse of the market at these meetings, and perhaps many *trysts* are held before the price is finally determined. Some appear to be resolved to guard themselves against imposition, for they sell their cattle conditionally, bargaining that if the prices rise within a limited time they shall receive so much more; and if they fall the drover shall obtain a deduction.

This traffic is carried on, with little intermission, from May to September. For from the system of winter starvation, too much pursued, few may be able to travel at first, or for a considerable time afterwards. The cattle, although the cattle that are ready fetch the best price, because they can be immediately put on the southern pastures.

The practice of letting cattle for hire is not unfrequent in the north. The hirer is usually bound to furnish the owner with one calf (of twenty-two pounds) of butter, and two stones of cheese for every cow, one calf and a variable sum of money according to the quality of the cattle, all expenses of keep being defrayed by the owner. This is an unsatisfactory mode of conducting a farm; and when the interests of the two parties are continually clashing, as they must with such a system of payment, there can be little cordiality on either side, and there is a great injustice on both.

THE NORTH HIGHLAND CATTLE.

THESE occupy the whole of Scotland north of Inverness, in the counties of Ross, Sutherland and Caithness, and the Orkney and Shetland islands. The cattle were exceedingly different from those which have been described, more diminutive in size, and fifty years ago were much valued for many valuable points. The heads of the native breed were small, the backs high and narrow, the ribs flat, the chest small, the legs large, the legs long; and, as a necessary consequence of all this, it was great difficulty in getting them fat at all, and they never grew equally. This is easily explained by the consideration that



[*The Shetland Bull.*]

with the northernmost group of islands, situated nearly on the coasts of Scotland and Norway. They consist of nearly sixty miles in length, and ten or twelve in breadth, a group of diminutive ones scattered around, and particularly Jamieson, in his 'Mineralogy,' page 2, says that, 'on islands, a wonderful scene of rugged, black, and barren itself to our view. No tree or shrub appears to relieve the eye over these dreary scenes, and only gray rocks appear amidst of marshes, and pools, and shores, bounded by the sea.' There are, in fact, few or no artificial grasses or green swards capable of protecting these crops, and grasses could not grow to perfection in the open fields of these islands: there is heath, and heath, and sea-weed, yet there is a breed of horses, small, but beautiful, and hardy, and strong; and the cattle are of the same origin with the West Highlanders. They are diminished in size by the coldness of the climate and the want of food, but they have not been so seriously injured by the folly of not having been domesticated to be starved outright. They are small, ill-shaped, so far, indeed, as their shape can be ascertained, but they have the long thick hair with which they are covered, and which affords a considerable defence against the snow and the sleet. They are about four feet high at the withers, and sometimes scarcely more than forty pounds a quarter.

The Shetland cows are housed every night, whether summer; and not having straw for litter, the defect is supplied with peat-dust. The dung used to be suffered to accumulate in a filthy manner. Instead of being daily carried out, it was spread until the cattle could no longer find entrance between the roof. Then only it was of necessity removed. They yield a good portion of milk, whether in their native country or elsewhere, which they do give is exceedingly rich.

The Shetlanders have a curious way of extracting the butter. The milk is put into the churn as soon as procured, and in two or three days elapse before the vessel is full. The process then commences; and when the butter is about to separate, when some red-hot stones are thrown in, and the churn is agitated until the separation is complete, and the butter floats on the surface, sometimes very carefully washed for home-consumption or for export, but when it is destined to constitute part of the rent (for that was, not many years ago, demanded in kind) it was so badly tasted. The butter-milk is then boiled, and another portion is separated, which is not so rich: this is chiefly reserved for the poor. The remaining fluid, called *bland*, used to be, but is not now, the ordinary drink of the poorer Shetlanders. It is sometimes kept until the winter, and is supposed to be very wholesome.

A country so barren may be easily overstocked, and it is so to a degree, particularly since the introduction of sheep husbandry, many of the calves are therefore killed very early, and some die every day that they are dropped. The calves that are reared are allowed to suck their mothers, but are fed, at first, with milk, and afterwards with *bland*. This is poor food, but they are by this means early habituated to the privations to which they are afterwards exposed.

The little Shetland oxen are still occasionally worked. Horses and oxen were formerly yoked abreast to the same plough. Oxen are gradually getting into disuse: indeed a great part of the soil is too rocky for the plough, and is dug with the spade; and even at the present day, the spade husbandry is used where it might be profitably introduced.

Some of the smaller islands called '*The Holmes*,' and which are or quite uninhabited, yield more succulent pasture; and are occasionally sent there to prepare them for their migration. They thrive rapidly on these little solitudes. When a statistical survey of these islands was taken forty years ago, they contained 30,000 sheep, 1,000 oxen, and 10,000 young cattle. They have, however, rapidly increased, for more than 44,000 now inhabit the Shetland and Orkney

grazed. The climate is moist and variable, the summer hot, the winters long, but not cold, the spring late, rather often continuing until June.

were formerly even smaller and more ill-shaped than have been considerably improved, for there is much good in them; but there is necessity for greater improvement in them ere they can become a very profitable stock. So the cattle, except the milch-cows, were turned out to the hills where they made a shift to preserve life, but were stinted. The queys were often five and six years old before they were turned out to their liberty, the corn is unripe must cut it down, or expect to find when hunger and cold force home the half-starved cattle the hill dykes are too weak to keep them out; it is no point to point these animals, or to prevent their incursions; armed with dogs to the mountains, perhaps after dozens of acres of standing corn.'—*Rev. J. Malcolm's Account of Stenness.*

are better milkers than the Shetlanders, and quite as good as those used for agricultural labour, and they are devoted to a different purpose than the Shetlanders; yet, compared with the Shetlanders, they are an inferior race. Their heads are low, their buttocks thin, their bones prominent, their horns curved backwards towards the forehead*.

Statistical Account of the Parish of Dalting, after saying that under cultivation, gives a very curious account of the manner of ploughing: 'there are not more than six ploughs in the parish. The plough is a crooked piece of wood, at the end of which is fixed a slender pole, which is fastened to the yoke laid across the necks of the oxen. The ploughman walks by its side, and directs it with a stilt or handle fixed to the pole, if so he can be called, goes before the oxen, and pulls them by their horns, and some people with spades follow the plough, to break the clods.

Wool of cattle and sheep are sold to the Lerwick merchants, who pack them to Leith market: 700 milch cows are kept in the parish, and 1000 head of cattle. A great part of the land is let on *butter-rent*. Good 12d. per merk of butter (about 20 lbs.), and 24s. Scots (2s. English) per acre for three-fourths of an acre. The butter is generally compounded for sale; for this, 40d. is required from each family for services, (assisting in ploughing, and various agricultural labours,) if they are not paid in kind. A hen is demanded for every two merks of land.' These customs are now growing into disuse. At that time a good ox was sold for 24l. (24s. sterling); and a fat cow sold for 24l. (24s. sterling). The ox would weigh from 170 to 250 lbs.

'the situation of that parish, and of the Highlands generally,

discouraged any attempt at improving the breed, and the student system of overstocking which we have reprobated in the completed the evil*. Captain Henderson, the scientific and writer of the 'Agricultural Survey of Caithness,' very says that 'these animals were not fed, but merely kept alive on straw given them twice a day from the end of December until the pasture would recover them in May and June; and that starved one-half of the year, they assumed a thin, lank shape

was most deplorable in the winter of 1784. The crop of oats failed in worse in 1783; and the winter of 1784 was a long and severe one. Much of absolute starvation. A mortality broke out, and destroyed many more in that parish. Oats rose to 45s. per boll. The most substantial farmers the poorer ones lived on welks, and limpets, and such other fish as the sea—*Sir John Sinclair's Statistical Account of Scotland.*

* The Rev. Mr. Cameron, in his Statistical Account of Halkirk, in some appropriate remarks on this point:—'I am persuaded that the number of cattle reared is near one-third more than it ought to have been, or the land can maintain. This is the cause why our cows do not usually yield so much milk as might be expected—why the cattle are in general poorer, and of less size than they ought to have been, and consequently fetch such low prices in the market. What is the cause of this unfrugal and mistaken plan? Because the commerce in that cattle is entirely a dependence; and they calculate their stock according to their number, and not to their quality. Besides, having no other way to answer Martinmas demands, they pinch their families in the necessary food arising from these animals, from the high expectation, and the mistaken idea, that if they have plenty of calves they can answer these demands, which hang a mighty terror over their heads even when it happens that they themselves and their cattle are half-starved, and their expectations often frustrated. Whereas, had they adopted another plan, and kept an adequate number of cattle only, their families would be better supported, the cattle in quality and value, and the demands of the landlord more readily answered.'

† The Rev. Mr. Taylor, in his Statistical Account of Watlin, in this county, says very strongly and properly reprobates the system of cattle-management. He says,—'From our remote situation and little intercourse with other counties, the system hitherto been neglected, if not despised. Of late, strangers have begun to visit us, but there are local practices and local prejudices among us which resist all change, and stand aside before great improvement can take place, or strangers reside with us. From time immemorial it had been the practice here, for cattle to travel and feed promiscuously, without distinction of property, from the beginning of the sheaf was put into the farm-yard till the conclusion of the bean seed, in the autumn, or the beginning of June. The prejudice of this practice to land in general, and in particular, is sufficiently evident. The active, enterprising farmer, who would himself of all the advantages to be derived from his possession, unless he could use and lay it out as he pleases. He can never benefit himself either by his own crops, so long as cattle of every kind—his neighbours, as well as his own—have access for eight months nearly out of the twelve, to traverse his fields, day and night, wet and dry. Such a custom may, and no doubt does profit the sluggard. His cattle are maintained at the expense of his neighbours; but men of this description are supported at the expense of the willing, industrious farmers. His spirited

of Galloway; and experience taught him the truth of the breed must be suited to the climate, or it will not yield the size of the Caithness cattle: they were better they did not fatten so kindly, and their milking proper-iorated.

at him of the West Highlanders, a kindred race, even e so degenerated; the inhabitants likewise of a cold ; thriving there, and possessing also those admirable e Caithness were so deficient. The experiment suc- vland farm, the Skye cattle grew to a size with which ss breed could compare, and they lost not one point a highland farm they were somewhat inferior in size; n more rapidly than the others; they made beef of the ty, and they well paid the farmer for their keep.

ss cattle were crossed by the West Highlanders; and were improved; and when they had become almost gyle blood, they were best of all. The Argyle cattle the lowlands,—the Skye for the higher and rougher considerable improvement was effected with regard g and the grazing of cattle. The only cause of regret the markets, yet the growing excellence of the cattle of the journey.

John Sinclair gradually discarded the Galloway even and from the Skye, and more particularly from the t as quick, and honest, and hardy workers, and pro- he could reasonably desire; and Caithness will not neighbouring counties of Sutherland or Ross in the r cattle.

f the climate of Caithness, and the want of food even ine, were great obstacles to improvement; to which ame miscalculating avarice which induced the breeders nties, to overstock their farms. The want of spring food, ome measure, supplied by the introduction of the rye- art early, and in the coldest weather, and afford a bite ady to cut, when nothing else is to be had: and when added to this, the improvement of the cattle, and the became greater; for the beast which had been turnip- and got rye-grass in the spring, was ready for the

d serve the public, ought not to be rendered abortive merely to f the sloven, who, rather than exert himself in constant acts of ve in a hovel, to be clothed in rags, and to feed upon bread and

cattle do not now fare so badly in Caithness as in some other parts. There is more arable ground here than is found farther north, although the beasts often wander over the commons during the winter to get straw, and, sometimes, turnips in the morning and evening.

In the highland part of the county the attention of the farmers and cattle are concerned, is principally devoted to the rearing of the Highland cattle, in fact, is the primitive, although not always the most profitable breed of the Highlander; but in the lower part of the country the dairy is added, or the land is principally cultivated for the dairy, and a different breed of cows is necessary. It is needless to repeat that the Highland cattle, excellent as they are for grazing, will yield a considerable profit as milkers. Sir John Sinclair first endeavoured to improve the native cattle with the Buchan breed. These were the best they were excellent dairy cows in their own peculiar district. To a great extent they answered, but the quantity was not increased so much as had been expected, and the grazing qualities were a little impaired.

He next tried the Dunlop or Ayrshire bull. The Caithness cattle are a better milker; but there was something in the character of the Highland beast that would not amalgamate with the lowland dairy blood. When on its native ground, it lost much of its propensity to spring. Many of the pure Ayrshire cows were therefore used in the lower part of Caithness, and they still maintain their ground, either purely or partially working upon the milking unthriftiness of the Highlander.

The dairy is often managed here in the same unsatisfactory manner as in other places more to the south. The farmer provides cattle and milk, but he has nothing to do with the manufacture of the produce. He gains with some dairy-woman to deliver to him annually a certain quantity of milk, two cows, and forty or fifty pounds of butter, and the same quantity of cheese for each cow, the value of which may be nearly 5*l.*; and more satisfactorily, and profitably too, take upon themselves the management of their property. The dairy has much improved since the introduction of the Ayrshire; but, on account of its situation and soil, it must always be inferior to that in the southernmost counties of Scotland. In the Orkney cows are used by the small farmers, and for a considerable distance there are few better.

Including the cattle both for the dairy and grazing, Caithness has about 15,000. Three thousand of these are annually sent to the drovers, who make their appearance in this county, and begin to collect the cattle *trysts*, about the latter end of April. The first regular market of the north-country cattle is at Amulrie on the first Wednesday of the month; to this succeeds Cockhill on the 16th, and then Falkirk, Brechin, and Newcastle. The *stots* are usually three years and a half when

Four were often driven abreast in the plough, the driver backward between the central oxen*. A small farmer, harnesses two ponies with a pair of oxen. The heavier we had a fair trial, and are nearly abandoned; and husbandry with the West Highland oxen, is not performed so much. The oxen are broken-in at three years' old; at five they are and they are worked until eight or ten years; when they are sent to the drovers in travelling condition, but oftener fattened. Their food in winter is straw, or chaff, and occasionally a little summer they have hay, but no corn, except the larger farms. When they are not at work, they pasture with the milch cows.

It is observed that in so ungenial a climate as that of Caithness, subject to many distempers. The sudden variation of temperature, and the change from starvation to comparative plenty, does at length, and with strange rapidity, proceed to the spring, are the causes of some of the most frequent diseases. Among the rest is inflammatory fever, known by the names of *black quarter* and *hasty*. Superstition is prevalent enough in all parts of the Highlands, but nowhere more than in Caithness. Captain Henderson gives some strange account of these diseases in a country where the name of smallpox is almost unknown. He says that 'in former times, when a man was seized with the black quarter it was taken to a house where he was never to enter, and there the heart was torn out while he was alive, and hung up in the house or byre where the cattle were, and while it was there, none of his cattle would touch him with that distemper.'

When a pestilence appeared the farmer would send for a *charm-doctor* to raise a *need-fire*. A circular booth was erected on a small island in the nearest river, or *burn*; and in the centre of it a pole was fixed, extending from the roof to the ground. A net was set across horizontally, with four short arms or levers in

Dr. John Dalrymple, in his Statistical Account of Dunnot (1794), explains this:—The cattle are generally drawn by four oxen or horses yoked abreast. That is, the driver is always looking towards the plough, and is always looking towards strangers, but a better acquaintance with the people's circumstances has led to a more favourable opinion. The cattle are very small and ill-fed, and their strength is not sufficient for drawing a plough, if they were yoked in any other manner. They might have an opportunity of throwing the whole burden occasionally on one side, but this practice, however, is attended with the inconvenience, that one of the cattle is obliged to plough the ground; of this some are beginning to be sensible, and are endeavouring to get those of a better quality. The driver sits on the back of the oxen, looking backward, or with his face to the plough, because he could thus exert the strength of the team was fairly and equally exerted.

kindling of a similar fire on the 1st of May. That day is still called the Gaelic *la-Beal-tin*, i. e. the day of Baal's fire.

A remnant of this superstition still exists among those who are behind in the march of improvement, and they are not a few. When a patient is seized with the murrain a few pieces of sooty *divots* (turf) are taken from a thatched roof (we have said that in some of the poor cottages the turf is put in the chimney) and put into a metal pot with a coal of fire, so that the sooty smoke ascends. The patient is then brought, and its head is forcibly held in the smoke for a quarter of an hour. Then some of the plaintain root is given, and the beast is cured. Some interesting analogies to old customs in other parts of the world, and far east, are evident.

SUTHERLAND.

SUTHERLAND and Caithness form the northern extremity of Scotland. The western coast of which is occupied by Sutherland. The western and northern coasts are bleak and stormy enough, and the mountains of immense height, have not even a stalk of heath on their barren summits. The south-eastern part of the country is more sheltered, and is consequently a deal colder, although rather more backward than some of the other counties of Scotland.

The soil is as various as the climate. There are few or no natural grasses, and the only natural meadows are the valleys formed by the rivers and burns; on them some cattle are fed, but on the higher parts of Sutherland and Ross, and the eastern and central Highlands, the cattle have given way to sheep. Although four times as large as any other county, this county does not contain twice the number of cattle. It has never been calculated to possess more than 25,000, and, probably, it now contains are not now more than two-thirds of that number.

The statistical accounts of the numbers of horses, cattle, and sheep in Sutherland, in 1798 and 1808, will afford a convincing proof of the increase of all of horses, cattle, and goats, and the wonderful increase of the sheep.

	Horses.	Cattle.	Goats.	
1798	7736	24,287	6227	
1808	4291	17,333	1128	
	Decrease 3445	Decrease 6954	Decrease 5099	Increase

If the value of each were the same at both times, we should find that 20,670*l.* less capital was employed in horses, 32,502*l.* less in cattle, 510*l.* less in goats, and 34,806*l.* more in sheep. But the manifest improvement in the management of the sheep is evident.

...y are things which cannot exist together, and especially
nous district, like the Highlands, or like Scotland gene-
ntity of food is raised, sufficient to maintain the same
bitants as before, the same number of hands are not
re it. Towns will be multiplied and filled, but the pea-
driven from the country, and their character and their
be changed: this will be a work of time—it cannot be
one generation—and the starving cottagers and the small
(must give way where sheep husbandry is introduced)
but to emigrate to foreign climes. All this is worth con-
general principle, and also as applicable to particular

, however, on that part of the Highlands where this
been adopted, we are, in a manner, compelled to draw
iled comparison between the old and the new way of
nd. We will suppose that the proprietor of a consider-
king a survey of his property,—the produce and the rent,
or deterioration of his land, the character and the degree
its occupants. What we have already said of the West
of Caithness, will prepare us for the result of his inquiry.
ne of the romantic Highland glens, and he finds them
with miserable huts, the occupants of which rent from him
land, for which they nominally pay him an exceedingly
oney.

so it may be called, consists of a strip of land on the side
l a larger portion on the hill above. Some of the glen
pted to be cultivated to raise a little corn for the winter
mily. This rarely succeeds; for the torrent pours down
greater part of the crop long before it is ready for the
farmer has seldom sufficient remaining for the support of
the winter, and that a long one in such a climate. But
cattle and his goats, and for the short summer months
to the hills, and there, at the shealings, they get fat, and

rapidly passes over, the herbage on the hills is all con-
nd his cattle return to the glen. The grass had in the
n there; it had ripened for hay; some of the family had
v it, and he has a little stock awaiting his return. It is a
arely sufficient for his *cows and his calves*. His growing
ng but the straw of his half-destroyed oat crop, on which
e during the winter—and starve many of them literally do
are mere walking skeletons, and, for a while, compara-

Would the Highlander consent to this?—would he give up his the joyous time of his miserable year?—would he abandon those and modes of management which had been practised by his forefathers out of mind?—Never! Then it was necessary to introduce a new race of men to accomplish this; and that was attempted, in despite of prejudices, and violent opposition of the people.

The new settlers were at first maltreated: the inhabitants gathered in every part; they broke down the fences; they got together the new sheep; some they forced into the lakes and drowned, and others they drove triumphantly to the edge of the county, there to be taken over to the mob of the next district, until they were expelled the Highlands, or had perished by the way. The laws of the country were successfully appealed to; the violence of the mob was suppressed, and the new system was left to feel its own way, and to stand or fall as it deserved.

It has weathered the storm, and is now the established system of husbandry in most of the Highland districts. Sheep now cover the hills which the half-starved stot and goat formerly wandered. The deer, which had not then been intruded upon,—which were perfect deer,—have been brought under a certain degree of cultivation; the mountains were depastured for a few months and left waste for the rest of the year; they are now grazed all the year round; and the low land, freed from the depredations of the deer, which it could not support, yields plentifully for the cattle and beast. The cattle, far from being banished, are somewhat reduced in number—improved in quality—fatter, and happier—fully equal to the cattle of the south, far more profitable to the breeder, and only confined to those pastures which sheep could not be safely fed. The population is certainly more numerous, but it is of a different character,—more intelligent, more industrious, more respectable, more useful; and the remainder have sought employment in the south, or emigrated to America or some of our British colonies. The value and the rent of the land is trebled; and the tenant can pay it, which he could not before: and, from a national point of view, the addition of food, the increased value of the land, and the unprecedented supply of the raw material for one of our most important manufactures, are circumstances of immense importance.

Having taken this cursory view of the change in the system of husbandry, as it regards cattle, we can proceed more rapidly.

The native breed of Sutherland is much smaller than that of the north, but far more valuable, and requiring only to be crossed by the blood of the Argyle and Skye, to be equal to any that the northern Highlands can produce. It is much to be lamented that the Argyleshire cat-

er breeds have been tried, as the Galloways, the Fifes, the improved Leicesters; but none of them have answered the Highlanders, or crosses between them and the natives. The islands on the coast afford very good winter-pasture. Orkney contains some valuable pasturage of this kind, reserved during the harvest, and on which the cattle are kept in November, and gradually taken out to be housed in the spring, or when they may appear to need provender. Some of the cattle are lost every year by attempting to climb to little islands among the rocks, with which the coasts of the islands

are fattened, but only got into good travelling condition. The four-year-old improved stots will probably weigh more than the country cattle not more than from 18 to 30 stones.

Feeding is the same as in Caithness, and the shealings used are of the same kind. The sheep now have left but little upland or primitive pastoral life. In the winter most of the cattle are kept in the barn, and fed with straw, and turned out into the fields in the morning, and on the whole, although the system of stocking is not so good as in Caithness, the cattle are not subject to all the hardships to which they are exposed in Caithness. When, however, it is consigned to the parts of Sutherland the cattle are not merely in the next morning, but actually enjoy the fire in common with the sheep in the morning, however cold or wet that may be, they are turned out to wander in the fields, it does not admit of much doubt

that they are seriously injured by the sudden transition. In the county of Dunrobin, they are not housed at all, not even the calves that have been weaned, nor the cows except at calving time. The following account of the management of cattle on the county of Sutherland (Farmer's Series—Farm Reports, p. 75):—The cattle are all bought in from the people who are settled in the county of Sutherland, in small lots of land, for the prosecution of the business. These people have one, two, or three cows each: the calves are kept at from nine months to a year old. The tillage farmer prepares them to travel south. He purchases them in April, and in the summer, on his superabundance of *deer-hair*, transfers them to certain coarse rushy loams, where coarse grass grows; the calves are put in *courtines* to eat straw in winter, and finishes them off for the next summer in the inclosures above-mentioned. With the exception of the space from the field appropriated to the horses, the four acres are divided, on an average, one beast and a half per acre. It is the

barren a country, and under such absurd and injurious management a cow yields little milk, or becomes suddenly dry, Mr. Penna 'Second Tour to Scotland,' tells us, that 'when the good perceives the effects of the malicious one on any of her kine, she draws as much milk as she can drain from the enchanted herd; for the witch usually leaves her very little. She then boils it with certain herbs and adds to them flints and tempered steel. This puts the witch in such a rage that she comes *nilling-willing* to the door, and begs to be admitted to obtain relief, by touching the powerful pot: the good woman agrees on her own terms; the witch restores the milk to the cattle, and is, at last, freed from her pains.'

Oxen are employed to a considerable extent on the coast of Scotland for road-work, and for the plough on many of the farms in the interior, but they are getting somewhat out of use: they are never shod.

ROSS AND CROMARTY.

THESE were originally distinct counties; but Cromarty was so small, and the additions that were made to it were in such detached portions, that scattered over Ross, that it is now, for the sake of convenience, almost of necessity, considered as amalgamated with Ross, and constituting but one county. The climate, like that of most of the Highland counties, is moist, but considerably warmer than that of Inverness or Sutherland. The meadow-ground is of small extent, and is reserved for winter-feed for the cattle, and comparatively little arable land is laid down for permanent pasture. The eastern portions of Ross and some portions of Cromarty contain excellent soil; and notwithstanding the wheat but the turnip husbandry is carried on extensively and successfully. The system is more connected with sheep-feeding than with the breeding or rearing of cattle.

For many excellent observations on the character and management of the Ross cattle, we are indebted to Sir George Stewart Mackenzie's survey of that county and Cromarty. It is a model of what agricultural surveys ought to be.

Ross may be divided into the low and high country: the former occupies the eastern coast and district, and the latter the western part of the county. The cattle which are kept in the lowlands are principally dairy, and they are a mixed breed. There are many pure West Highlanders, but not so small as the common breed of cattle in the counties to the north, but there are more of the native cattle, with various crosses; and others have the Fife and the Moray, and crosses of that kind with them. The dairy, however, is not attended to for pro-

quarter. They are a middle-sized, strong, compact, hardy
to the general means and climate of the country; but
not to degenerate, and, after the third or fourth generation,
are better than the common country cattle. The cattle of
on this account, *Kintail no Bogh*, Kintail of cows, are
in the Highlands. Some say that they are the progenitors
of the breed; but we are more inclined to trace them to the Skye
as they bear great resemblance, and, like them, they are
the Argyles. Their distinguishing and favourable points
are a thick pile, and weight, in proportion to their apparent
neighbourhood of Kilmure there used to be a peculiar breed
the result of a cross between the Fife or Aberdeen and the
Highlands, a cross that added to the size and value of the beast.

It became so valuable in this district it was customary, as in
the Highlands, to allow one calf to suck two cows.
The mother was easily reconciled to it after it had been covered a
little with the skin of her own that had been slaughtered; but now
the mother calf. The young ones are suffered to suck for four,
or five months, according to the time at which they were dropped,—a
calf being previously drawn for the dairy; but the cow will
lose so much that it shall not go, for, after the dairy-maid has wrung
all she can extract, the mother has retained more than enough

The latest of them are weaned in the early part of
the year, and all are then sent to the best pasture until the winter
is too far advanced to set in; when they are housed, and fed, as the farm
with oat-straw and hay, to which turnips or potatoes, and
the former, are occasionally added. On the following spring
they are sent to hill-pasture; and in the winter are brought home to the
pasture which had been occupied by the milch-cows, and are fed, if
necessary, with straw and hay. Thence, in the spring, they are removed
to the grass of the farm, and still occasionally fed, if needful;
and at the end of the third winter they once more follow the cows
to the best winter pasture of the farm.

The business of the farm, although now sometimes to be com-
pared to the ruinous extent to which it used to be; and
with fewer cattle for the drover, they bring him more money:
fit for travelling, and he has escaped the serious losses
which used to annoy and cripple his predecessors.

The cows are usually sold at three and a half and four years, and
at Perth, and Sterling, and Dumbarton, at the latter end
of the year. The *trysts* and markets continue here until
the cows come into request. So much business, how-

when lean, will weigh from 60 to 70 lbs. per quarter, and will fatten to 100 lbs.

Very few beasts are fattened in any part of Ross; and the flocks so consist of old oxen or cows, and principally for the supply of the army and Fort St. George. For home consumption the West Highland is preferred; but the spare turnips are mostly used in bringing up young cattle.

Oxen were formerly more used for husbandry in the eastern part of the county than they are at present. They were not reared in the county, but purchased at the different fairs in this county, or in Sutherland. In some years' work they were generally sold to the grazier or tennan at a higher price than that at which they were bought. When now used generally there are four to a plough, or four oxen and two horses. On a stiff and stony ground six oxen were occasionally used. The four oxen cannot well go without a driver, but it is sometimes attempted. The pair used for the harrow, on very light land, require a driver. Curious stories were formerly told of the strength of the horses and oxen and cows harnessed to the ploughs of the snout. Oxen are rarely used on the road. *

* Since this sketch of Ross-shire was sent to the press, we have been favoured with a valuable account of the cattle of this district and their management, by Mr. Millbank, near Dingwall. It strongly corroborates our main points; but at the same time giving a different illustration of a few particulars, we deem it right to present it to our readers.

‘Although it is difficult to trace the history or true pedigree of the old Ross-shire breed of cattle, the various accounts that are handed down regarding it shew that it has existed as a separate and distinct one. The breed taken collectively, or as it may be called the north Highland breed, is exceedingly hardy and of very compact form. It is comparatively light in form, but the bone is fine, and the carcass is deep and lengthened in the barrel, straight in the houghs and back, with a pile stronger and more muscular than that of almost any other breed. The head is generally light, with broad short shaggy ears, and well-turned horns; and they are of all colours, but the brindled predominate, and are the favourites, as indicating most constitution.

‘No description of cattle answers the soil and climate of Ross-shire so well as the north Highlanders; but as a considerable part of the county is very highly cultivated, producing every variety of feeding, and fit for the reception of any kind of stock, crosses have been introduced, and some with advantage. Of these, a cross with the Ayrshire or Leithenshire horned cattle has produced very superior stock, both in point of size and weight, and for the use of the dairy. For the latter purpose, a cross with the Highland is often made; but that is found advantageous only in situations where there is a good fusion of grass and turnips in their season; and the stock produced from it is not in demand either for feeding or driving. That which is most successful is by the extensive breeders of the county, is a cross from the Argyleshire Highland. This is of greater weight and size than the cattle of the north; but in availing themselves of this cross, the Ross-shire breeders are always anxious to preserve as much as possible of their own stamp, because it is more hardy, more suited to their pastures generally.

cow may be computed, during five months of the year, at from five to six pounds of milk per day, and from four to six pounds of butter, with rather more of cheese, in the week.

more profitable course, is what is followed, and there being but little feeding, the cattle are chiefly sold to the southern dealers at two and three years of age, and such of them as have been kept for some time by the agricultural tenants, and brought to their full growth, are as fine animals as can be

It also very often happens that the breeders dispose of their young cattle to the dealers and farmers at the age of six quarters, there being many farms calculated for rearing, and *vice versa*. A well-bred Highland cow of three or four years old, when fully fed, will weigh twenty-five stones, of the Dutch; but though it rarely brings a remunerating price to the feeder, it is reputed for quick feeding and for yielding more tallow in proportion to others, while it is ascertained that when they arrive on the pasture, they compete in point of profit with any kind whatever.

Those that are sent out of Ross-shire, those of the island of *Lewis* (from which a considerable quantity is annually exported) are most sought after for the table, from the fineness of the

Though of less size, and less prepossessing in appearance, than the English beef, which is always marbled is esteemed as being very superior in quality, so hardy, that in driving even to the most southern parts of England they do not lose in condition, if properly attended to.

Managing a breeding stock of Highland cattle is simple, but very interesting. It requires much knowledge of it, at the period when it was most extensively practiced, was confined to the natives of its pastoral districts, and formed their principal occupation. This was about twenty or twenty-five years ago, when one-half of the Highland cattle, in farms carrying from twenty to sixty breeding cows, of which the males were to be always distinguished at market. The principal and leading points of management consist in particular attention to pedigree; in a careful disposal of the pastures; and in the various arrangements connected with their food, whether in the produce of the meadows, or in the appropriation of the pasturage to the different breeds, scrupulously reserving the roughest grasses and more sheltered portions, for the winter, when it is of great consequence to have the stock of Highland cattle in good condition.

What is necessary for a breeding fold of cows is generally composed of an experienced herdsman, known by the name of the "Bowman," whose wife is head female assistant, at the rate of one to twenty cows, and herd-lads in proportion, and some younger followers to tend the calves, during the intervals of milking their dams. It is customary, on extensive farms, to have "sheals" or different stations, for the temporary accommodation of such an establishment, and it is necessary to move the cows from place to place in order to give them the whole grasses in due season; and as undivided attention is bestowed on the management, very superior stock is bred in this manner. The mode of rearing Highland cattle, is by suckling, and not by hand-feeding—that is, by allowing the calf to suck a certain portion of the milk at stated periods in the mornings and evenings. The common way is, to allow the calf to suck two teats, while the dairy-maid milks the other two; or else to allow the calf the use of the whole, at the expense of the dairy-maid. Both calves and cows are found to thrive much better when allowed to run constantly together; and besides, there is the advantage of extra dairy produce. This mode of half-suckling prepares them likewise for weaning; and the process of weaning generally takes place towards the end of the year. When the calves have been weaned, the stirks, as they are then called, are put up for the winter in large byres, and fed on the finest of the meadow hay; and as they are rapidly grown to any extent on the large pastoral farms of the High-

by oxen, and then the object of the farmer was to obtain a heavier breed than the native one, or the West Highlanders. was, to a certain degree accomplished, but the beast became coarse, not fatten so kindly, and even its qualities as a milker were not improved. Very few pairs of oxen, however, are now seen; farmers have gone back to the native and smaller, but more profitable breed. The Isle of Skye bulls have been in much demand, being crossed with the best cows, there are, in the higher counties, as fine specimens of Highland cattle as any part of Scotland produce; the colour is not so uniform, but none of the good qualities are lost.

Nairn is a breeding and rearing district. The early cattle, when in tolerably good grazing condition, are sent to Banffshire fairs, in almost every village, succeed one another from the spring

to the autumn, a run or outgo during the day, on the roughest of the pasture, supplied with hay. The cows, after being separated from their calves, are sent to the portion of the farm which has been set apart for a general wintering; but when calving time approaches, the season is very severe, they are again brought near to the byre, fed from the byre, and treated with much care. The winter and spring being past, the year-olds are put upon low-lying haugh or woodland pasture, while the stronger part of the stock is sent to graze on the higher and more remote pendicles of the farm, to which special care being taken to select and retain such of them as are best calculated to supply the place of the draft of aged cows annually made from the fold, while the young bulls are kept as will afford a choice.

'The breeding of cattle in Ross-shire, however, has decreased very much, and generally speaking, has become much deteriorated within the last twenty years, on account of the rapid extension of sheep-farming. Sheep have, in fact, become the staple of the North Highlands, and the system is attended with less expense, and perhaps, a more certain return than any other to the occupier of the land. In the greater part of the pastoral districts of Ross-shire is best adapted for sheep. In the opinion of many persons of experience, that, from the almost universal breeding of the same species of stock, cattle would pay fully as well in situations where equal care and keeping could be afforded in winter as in summer. So great is the preference now in Ross-shire, that the breeding of *fine* cattle is almost entirely confined to the amateur proprietor, and a few tenants, who still maintain opinions differing from those of the shepherds, who have acquired by far the greatest part of the lands. The number of cattle, of all descriptions, bred within the county is very considerable, but the greater proportion of them are of the native breed, they have become diminished in number, there being but little reservation of hill-ground made in their favour, and frequently excluded from the pastures that produce most bone and constitution. The system of throwing several cattle-farms into one sheep-walk has limited the breeding of cattle generally to tenants of small holdings, in the least favoured situations, and placed either along the shores, or on the outskirts of the larger tenements. Wanting good bulls in such situations, joined to other disadvantages, the breeding of cattle retains the original character, has greatly fallen off.

'Upon the whole, therefore, there is at present a great decrease and a general deterioration in Ross-shire cattle; but many of a superior description are still bred in the county, while the greater number of the whole are of the original stamp.'

of cattle is undoubtedly the Kyloe improved, or, rather, good keeping, and crossing with Aberdeenshire horned great number of Buchan cows brought over as milch cows. Intermediate size between the Aberdeens and Kyloes, are adapted for grazing than for the dairy, affording beef quality, but scarcely of the size that would be desirable.

It informs us that some short-horned bulls have been lately a view to the production of an animal that will attain a There has not, however, been time to ascertain the result, but a previous cross with the Galloways did not answer of those who tried it. The cross with the short-horns, if effect two very important objects, and in which the High-land, —increase of weight, and earliness of ripening. Mr. Deuchar, by whom we have been favoured with some, the Moray or Elgin cattle have more of the Aberdeen than of the Kyloe; but they are neater and more compact than, and have of late greatly improved in consequence of being given for breeding stock by the Morayshire Farming Club and Society.

They are all fed in their native district, being too far distant from the ports. A four-year-old, stalled in winter and fed on straw averages about 45 stones. Some oxen that have been seven or eight years old, have weighed 70 or 80 stones. They are brought to perfection in Moray; but after having spent the winter, or put into a straw-yard, and fed on many turnips as will keep them in tolerable condition and they are generally sold to the Aberdeen and Angusshire districts, as soon as the grass is ready. Several cattle have been stall-fed in the neighbourhood of Elgin, particularly by Mr. Macfarlane of Linleswood, and conveyed to Smithfield by steamers from Aberdeen. Steam navigation will probably, ere long, effect a great improvement in the system of breeding and feeding in the maritime west and north-east of Scotland.

The cows are suffered to suck until they are weaned. In winter they are stall-fed, and fed on straw or turnips, and in the spring

The queys are not allowed to have calves until they are three years old and are fed off at six or seven.

Stall-feeding, with the same quantity of straw and turnips, is, in this district, to be preferable to stall-feeding. The cattle-dealers and the beasts stand the road better, and especially in case of bad

symmetry.

Very few true specimens of that hardy and valuable Banffshire cattle, are now to be met with, except in some districts of the county; and even these, from the shortness the want of turnips, in winter are considerably stunted in. Mr. Tait, veterinary-surgeon at Portsoy, to whom we returned for some valuable information, says, that 'Any of the old to be seen in the better cultivated districts are very hands for the most part with fine springing white horns with black small heads, but broad between the eyes, and with short They are short in the legs, clean in the bone, and the flesh upon the legs. The body is rather long, the ribs round, broad and straight; the colour, for the most part, black party-colours being rarely met with in the native breed. The superior travellers, and at four years old will weigh from 50

The cows are not celebrated for the quantity of milk they give but it is usually of very superior quality. From three to milk may be reckoned the average produce on good pasturage prime of the season.

Banff is principally a breeding country; a few oxen are reared in the upper part of the district*; on the coast some are prepared for the Mearns and Aberdeen markets: most of them are half fat; but a few are finished off with turnips and hay. The tenant of Mill of Byndie, near Banff, feeds a considerable number of beasts full-fat, which he sends to Smithfield by the smacks from Aberdeen and Banff, and by the Aberdeen steam-vessels. There are no artificial pastures about the coast, but in the upper part of the county there is little beside the natural herbage, and that not improved by manure. Banffshire is indebted to Lord Findlater for a great part of the improvements that have taken place in that district. When his Lordship first took up his residence in Banff Castle, in 1753, there were no roads, no turnips or potatoes reared, no grass-seed sown, and no inclosure made, except about the houses of a few of the proprietors. He first took into his own hands one of his farms (Craigherbs) near Banff Castle, and followed the example of it, and laid down part of it in turnips, and part of it in grass. He sent the sons of some of the farmers to study agriculture. When his lease was expired, he commenced the management of another

* The old Banff plough used to be drawn by six, or eight, or ten oxen and cows intermingled, or by oxen and horses. The black cattle were usually sold at Whitsuntide and sold again in the autumn.

, informs us, that about thirty years ago the Galloway
s introduced into this district, and has increased so much,
a large portion of the heavy stock ; some of the Buchan
, but a distinct breed, appear in some of the districts of
devoted to the purposes of the dairy. Many of the
ne Banff with the polled breed of Aberdeen, in order to
light, and which was warranted by the superior system of
as lately been adopted in the greater part of the county ;
oned, but not with so much reason, on the early maturity
hers, and at the head of them stands Mr. Milne of Mill
whom also we owe much obligation, has all his cows of
crossed with the Isle of Skye bull. Mr. Milne considers
st valuable stock that the country produces.

and Teeswater beasts are likewise also seen. A short-
ately introduced by Mr. Wilson, of Brangan, whose stock
ere is much prejudice against the short-horns at present
is supposed that the keep of this district can never be
them, and that the greater price, in proportion to their
the native stock, would yield greater profit to the farmer
tain from a heavier and more expensively fed beast.
this is an unfounded prejudice ; and we have no doubt
e, as everywhere else, the short-horn, cautiously and
iced, will ultimately have justice done to him.

supposed to have been done to the Banffshire breed of
pted introduction of the long-horns, forty or fifty years
h these, and especially when persisted in, produced an
ely animal, in which every good quality of the progenitors
g the most intelligent and successful breeders in Banff-
on Mr. Gordon of Laggan, Mr. Gauld of Edinglassie,
A. Milne of Boyndie.

e-ploughing has superseded ox-labour, the number of
e has materially increased since the establishment of the
eeding.

ABERDEENSHIRE.

ounty, breeding or grazing more cattle than any other
nd, will require particular attention. The number of
n his Statistical Account of Forglen, says, in 1795, that 'on the
y the richness of the pasture, are of a large size. One tenant in
of eight oxen, which would, in most seasons, have been good beef
ould have weighed from fifty to seventy stones, at an average, and,
y to ninety, and some seemed size enough to carry one hundred.'

the interior, and on the hills, formerly occupying the whole district, and still existing in considerable numbers, is the Highland breed. It is suited to its locality: hardy but not and thriving, to a certain extent, on its scanty fare; and at and when it was thought to be prepared for the dealers, weighed not more than $3\frac{1}{2}$ cwt.; but with a disposition to grow to the which its natural form is capable when conveyed to the south.

This breed, however, would be out of its place in the and more productive soil of the lower district of Aberdeen of cattle was therefore gradually raised, the precise origin difficult to describe.

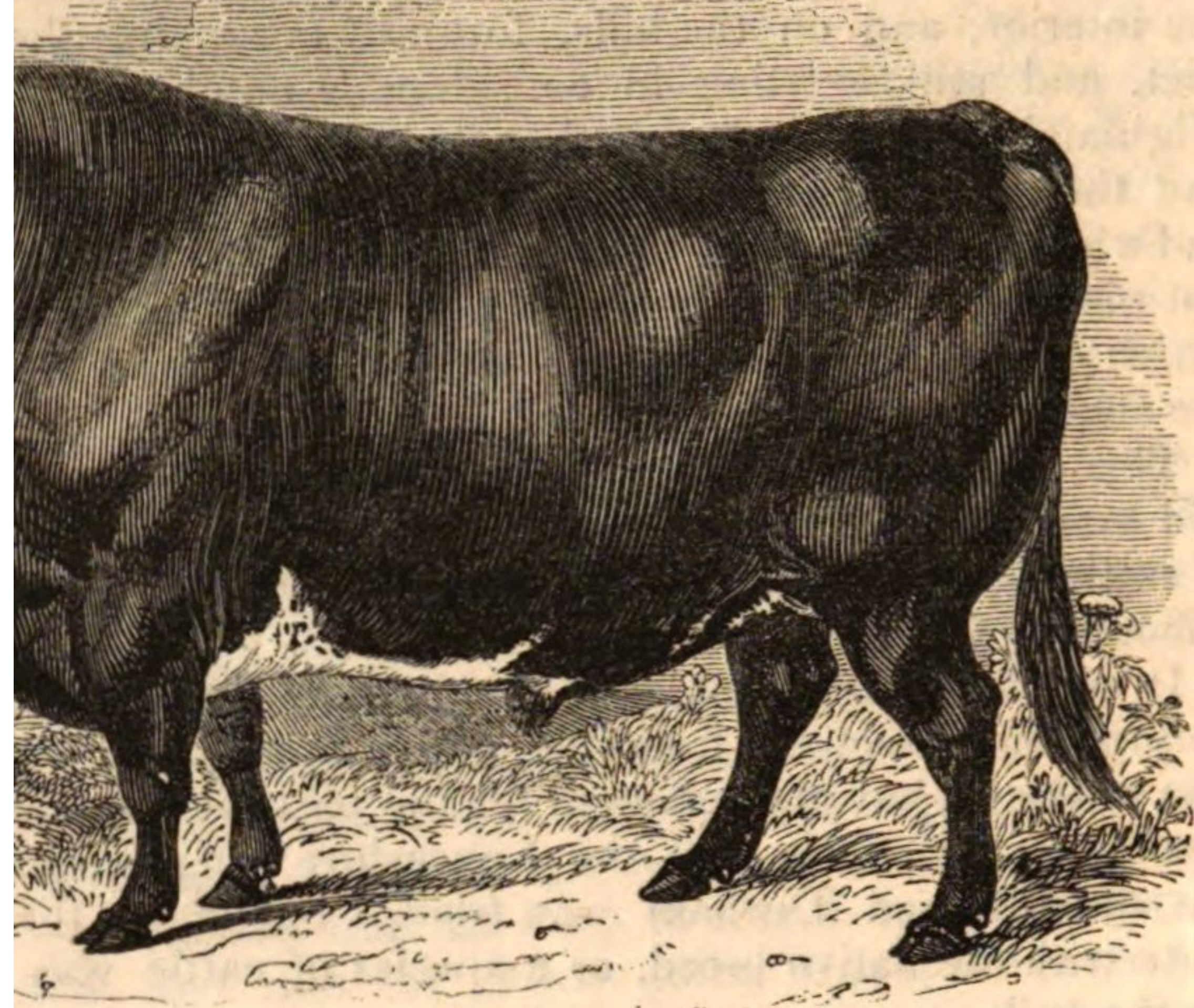
It was first attempted, as in the districts that we have already by judicious selections from the native breed, and some was obtained, but not sufficient for the pasture. Some spirit then sent far south, and the Lancashire long-horn was the short-horned Durham was tried; but either they did mate with the native breed, or a species of cattle was produced for the soil.

There were, however, some splendid exceptions to this glad that we can present our readers with a portrait of two stages of his preparation for the market.—(See p. 104)

This beautiful animal was bred by Lord Kintore from an cow and a Teeswater bull. We are indebted to his lordship materials of our history of him. He was calved in April, the Michaelmas of that year he was tied up in the house, a practice of the country, with the other calves. He got turnips hay, and straw alternately twice a day. They were the turnips, which are not considered so nutritious as the Aberdeen and four or five ounces of salt were given him daily.

In 1828 he was at pasture from the 1st of May to the 2nd and was then put into a straw-yard with sheds, getting about of oil-cake daily, with plenty of water and hay and straw, until May, 1829, when he again was sent to pasture until the 1st of tober. He then got a limited quantity of Aberdeen yellow the house, as Lord Kintore did not then intend to have him went out almost daily for water and exercise until the 1st of when he was again put into the straw-yard until the middle of about six pounds and a half of oil-cake daily, with the usual hay and straw.

He was afterwards at pasture until the 8th of October, and

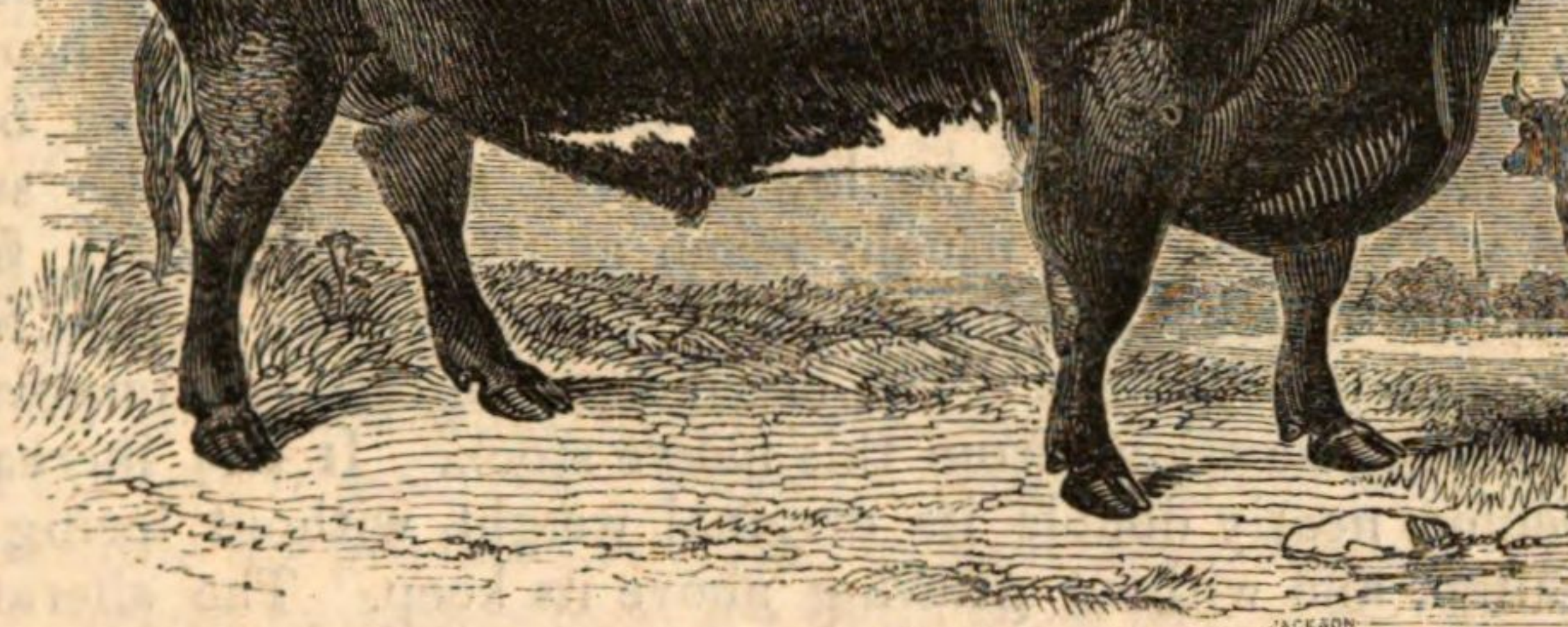


When he was first sent to the South—a Cross between the Aberdeen and the Improved Short-horn.]

ed to the care of Lord Kintore's friend, Mr. Harvey
use his own discretion whether he would exhibit him
field cattle-show, and compete for a prize among the
ther he would keep him another year, and try for the
ombe decided, and very judiciously, to give him ano-

He was accordingly taken down to that gentleman's
and from October to April was fed upon Swedish
th about six pounds of oil-cake daily, and during the
he had cut grass and oatmeal. He was let out daily
s greatest pleasure seemed to be to go among the cows
the yard, and talk to them. He was exceedingly
approached him or handled him he scarcely moved,
d not suffer the man who was once compelled to bleed
im for a week.

e commenced oil-cake and hay, eating about twelve
e former, until he was sent to Smithfield. During the
had a lump of rock salt in his manger, of which he
nd. A basket of earth also stood by him, of which he
considerable quantity, and which operated as a gentle



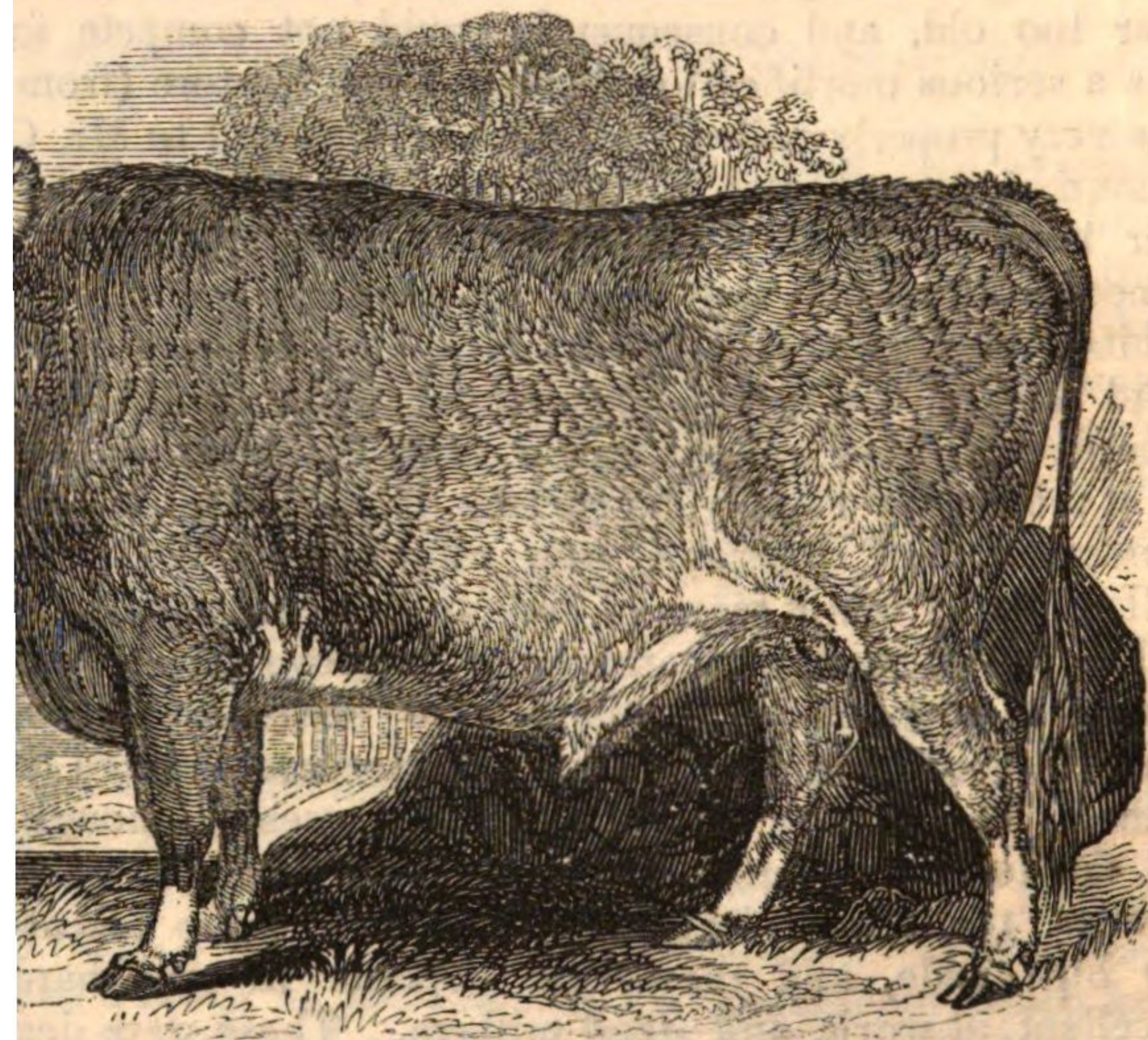
[*The Kintore Ox, fattened.*]

He was supposed now to weigh more than 180 stones in and nearly, or quite, 320 stones Smithfield weight. He was admired, particularly his still beautiful symmetry, the evenness in which the fat was laid upon him, and his almost perfect symmetry from the shoulder to the tail.

In the mean time the regulations of the Smithfield club as to the age of cattle had been altered, and this noble animal was a year too old, and consequently could not compete for an award. This was a serious mortification both to Lord Kintore (from whom the ox was very properly called the Kintore Ox) and to Mr. Combles, a gentleman, however, was bid 75*l.* for him; but as Lord Kintore had another beast at Keith Hall a year younger, and nearly as good, he determined to have him sent down to Scotland again, in order to exhibit them both at the next Highland Society cattle show. Lord Kintore is a great advocate for one cross of the Teeswater with the Aberdeen. This animal was a sufficient proof of what may be accomplished by it; but they rapidly degenerate if the cross is further continued. The convenience of carriage, now afforded by the introduction of the iron will probably tempt many of the northern breeders to try the same.

In the attempt permanently to improve the Aberdeen breed, the southern counties of Scotland were occasionally resorted to, but with doubtful success, until at length the breeders directed their attention home. The Fife, or Falkland breed, possessed enough of the native to bid fair to mingle and be identified with the natives, while the Fife was smaller, the limbs cleaner, and yet short; the carcass fairer, the hips wide, and they were superior in size, hardy, and excellent at work, and good milkers. These were desirable qualities particularly as mingling with the Highland breed. Accordingly, a few from Fife were introduced into Aberdeen, and the project answered the expectation of the breeder as to be general, and to become the foundation or origin of what is now regarded as the deenshire native breed.

s only for one year. At four years old they are usually six months, after which they will weigh from 5 to 6 cwt. In fertile districts of the low country, abounding with summer food, they usually reach at their full growth from 12 to 15 cwt. Dutch; and have been frequently known to feed from 100 to 120 pounds. The breed has progressively improved, by judicious selections from this native stock. It has increased nearly double its original weight, without losing its hardiness, and without growing above its keep. The alteration in agriculture, and the introduction of turnip-husbandry, have effected this. Mr. Leith of Whitehaugh, and Mr. Camine have much contributed to the improvement of the Aberdeen-breed of the former gentleman was remarkable, not only in increased size, and the perfection of some of their points, but in the horns, which are usually well horned; the cows of Mr. Camine give from ten to twelve Scots pints of milk, instead of four pints, which may be the average produce of a tolerable cow.



[*The Aberdeen Ox.*]

There is a breed of polled cattle, said by some to be different from the Aberdeen, and to have existed from time immemorial; others,

them in the 'Quarterly Journal of Agriculture:—'The cattle are chiefly of the short-horned kind,' (he means comparative he thus speaks of them in opposition to the long horns,) 'not but short-legged and hardy. The best sort used to be polled of them, that do not begin to have the Ayrshire blood in them and are of a dark or brown colour. The breed of cattle in Buchan is peculiar to that part of the country, and deservedly esteemed for its milk and the beef it produces. From the great extent of grass land more cattle are produced in it than in most other districts. They are usually bought by dealers from the south when two, three, and four years old, and at the latter age they weigh from fifty to sixty stones. The Buchan are not large, but, on account of the excellent quality of the milk, they yield a considerable quantity of milk, from the cream of which butter is made to a great extent, and of excellent quality.'

Notwithstanding their small size, they will yield from three to four and sometimes seven gallons of milk per day. They are fed with oat-straw in the winter, but they sometimes get plotted with turnips on which boiling water has been poured. It used to be the custom in the neighbourhood of Peterhead to give them green kale in the winter, which is sown in the preceding spring, transplanted in June or July, and in the winter better than turnips, and vegetates strongly in the winter. By adopting this plan, the dreadful interval for the farmer between autumn and summer feed was in a great measure filled up.

'In the course of the year there are nearly fifty markets in the Buchan district for the sale of cattle, and the amount of the sales may be estimated at upwards of 12,000*l.* annually.' If we suppose that one-fourth of the Buchan cattle are sold at this fair, we shall have an idea of the annual value of the beasts that are drafted from this district. Calculating this district at not quite a fourth of the superficial area of the county, yet containing a considerable portion of the rich soil, we may fairly conclude that 150,000*l.* are brought into the county of black cattle alone †.

* Mr. M'Pherson says, that 'a variety of the polled cattle is the principal breed of the Buchan district of Aberdeenshire.' The native, or Buchan cattle, were not so hardy as the common Aberdeenshire cattle, and do not fatten so speedily.

† The value of those slaughtered for home consumption should be added to the above. There are about 10,000, at 10*l.* per head, yielding 100,000*l.*; so that the total value of the Aberdeenshire cattle annually sold or killed will be 250,000*l.* Dr. Keith, in his 'Statistics of Aberdeenshire,' has given a very laboured account of the value of the cattle stock, which may be interesting to the reader, since some of the principal markets for cattle are in this county, and it contains nearly double the number of beasts

d, while his selections from the native breed were most
 although the cattle retain much of their original cha-
 been considerably improved, while a spirit of emulation
 which cannot fail to be useful.

ounty except Perth. His calculation was made in 1810. He sup-

7l. each, value	£196,000
re reared at 2l.	44,000
s at 3l. 15s.	75,000
olds at 7l. 10s.	142,500
ars and upwards, at 12l. 10s.	262,500

umber, and in value £720,000

om the records of Aberdeen,
 ightered in the city :

r there are 300 at £30	£ 9000
„ 600 at 25	15,000
„ 800 at 20	16,000
„ 800 at 16	12,800
le „ 800 at 12 10s.	10,000
„ 380 at 10	3,800
„ 1621 worth at least	3,400

erdeen 5301 Value £70,000

head, Tarriff, and other smaller towns, about the same
 chiefly cows and other inferior cattle, and the value

1	30,000
12,000 at 12l. 10s.	150,000

hose which are killed or sold	250,000
above	720,000

e of Aberdeenshire Cattle £970,000,

the annual rent, and a fourth part of the whole annual produce and
 of every kind.

armer's Magazine (1807) gives a curious and interesting account
 andry stock in this district in the year 1747. He obtained it from a
 in the eighty-ninth year of his age. 'On the death of his father he
 to service, and the highest wages he ever obtained were 16s. 8d. in the
 he agreed with a landed proprietor to cut a ditch through a piece of
 eet wide at top, six at bottom, and six feet deep, for two-thirds of a
 ell, and while thus employed he paid 13d. per week for his board.
 a course of honest industry and frugality, he found his stock, in
 0l. sterling, with which he purchased eight oxen, all under six years
 hree horses, four one-year-old stots and queys, furnished his house,
 harrows, &c., paid the expense of his marriage, servants' wages, and
 at Lammas 1748, when he began to harvest his first crop, he was not
 world.'

of fattening the grown beast. The general practice is to fatten with milk warm from the cow; but they are sometimes suckled until they are weaned, and, in a few instances, they are fattened on oil-cakes. Formerly, however, the calves were permitted to run large through the fields during summer, and pick up the roots of the corn. The practice was occasioned by the want of food and enclosures, and the fear of the calves being injured when confined with the large cattle in the fold; but it was attended with great damage to the corn from their lying upon it and trampling it. The calves acquired so restless a habit, that it was afterwards found necessary to confine them, except by the strongest and almost impene- trable fences. The cattle are pastured in the fields in summer, and fed with turnips and turnips in winter, and sometimes with steamed potatoes, and clover hay*.

Little butter or cheese is sent out of the county except from the town of Buchan; the rest is consumed by the farmers or the people of the towns. The Buchan cows have been stated to be good milkers; those along the coast answer tolerably for the dairy.

Dr. Keith has formed a curious computation of the value of the butter, and cheese yielded by them.

1000 best cows, in the neighbourhood of some town, and particularly of Aberdeen, yield butter and cheese to the value of 20 <i>l</i> . each, or	20000
2000 at 15 <i>l</i> . each	30000
5000 at 10 <i>l</i> . each	50000
10,000 farmers' cows at 8 <i>l</i> . each	80000
5000 of cottagers' or villagers' at 6 <i>l</i> . each	30000
5000 small Highland cows at 4 <i>l</i> . each	20000

28,000 as already stated, and value of their produce

* Mr. Gordon, in his answers to certain queries circulated by the Board of Agriculture, relates a singular instance of fecundity and early maturity in cattle:—'On the 25th of September, 1805, a calf of five months old, of the deenshire breed, happening to be put into an enclosure among other cattle, with a male that was only one year old. In the month of June following, at the end of six months, she brought forth a very fine calf, and in the summer of 1807, she brought forth a second calf, which was also very good. The first calf, after working in the winter, spring and summer, was killed in January, 1810, and weighed 6cwt. 3qrs. 16lb. The second was killed in 1810, aged three years, six months, and weighed exactly 7cwt.; and on the 1st of 1807, the mother, after having brought up these calves, was killed at the age of four years and eight months, and weighed 4cwt. 1 qr. the four quarters, sinking in the water.

† The Statistical Account, describing the parish of Udny, states that, in the neighbourhood of Aberdeen yielded from six to ten Scotch pints of milk.

ly insinuates itself in the form of a wedge between Aber-
 rfar. It is only thirty-two miles in length, and twenty-
 its broadest part, and much diversified with hill and dale,
 possessing, within a little extent, a very great difference of
 neighbourhood of the Grampians, occasionally covered
 in the summer, the climate is cold; along the coast, and
 rly wind, it is likewise chilling; and it is only about the
 that it is mild and genial. The character of the cattle
 imate. In the neighbourhood of the Grampians we have
 ders; but about the Dee, and even on the coast, they are
 ose of Buchan. A great many cattle are bred in the Mearns,
 as much a grazing as a breeding country; and although
 many of its own beasts southward, a considerable number
 fairs in Aberdeenshire, which are fed on what are termed
 that are found in the neighbourhood of almost every gen-
 ese, however, are only *flying stock*.

colour of the Mearns cattle is black; but some are dark-
 ed. They have rather larger and more spreading horns
 erdeenshire; they feed as kindly as the Buchans, and are
 to them for the dairy.

, and that one farmer kept fourteen cows, the milk of which, after the
 sent to Aberdeen, and sold at 1*d.* and 1½*d.* the Scotch pint (2 quarts);
 these cows was two stones per week, and usually sold at 8*d.* per lb.

epherd, in his statistical account of Bourtie confirms this. Writing
 about twenty years ago our country did not breed cattle of sufficient
 labour the ground. They were mostly brought from the south, par-
 ire. In a few years, by hard labour, they were worn out and became
 , as the farmer had not the means of fattening them, he very often
 d part of what they cost him. The case is now much altered for the
 brings up oxen able for his work; sells them or fattens them when
 on the decline; and in this way is rather a considerable gainer than
 cattle.'

h, in his account of Keig, in the same year, says that the majority
 all, and the horses and cattle of two neighbouring tenants are often
 h. He calculates the number of ploughs at 47, drawn by 88 *horses*,
ten and young cattle.

ie, in his account of Alford, in 1795, says, 'Every farmer is ambi-
 y pairs of oxen in his plough: some have six, and few common far-
 four. Smaller tenants yoke oxen, horses, and even bulls, cows, and
 ce up what they deem a sufficient strength. Every farmer sells one
 yearly, and replaces them by others of his own rearing.'

lair, in his 'Statistical Account of Scotland,' and speaking of the
 l and Kenhall, says that they contained '1038 cattle, whose value is

Scottish breed; and, unless it be from Buchan, I have now
land seen a more stately ox*.

‘A Mearns ox of a year old will weigh about 17 stones, Imp
one of two years will average 28; one of three years old 40
four years old 52; increasing in weight ten stones per year
year. Some, however, will grow to 90 stones; and Sir Ale
say killed one that was above 156 stones. A century ago t
did not weigh more than 25 or 30 stones.’

In the statistical report, it appeared that the number
24,825, or, at the rate of one beast for every three acres i
Of this number 6236 were milch cows, and 5280 calves unde

Mr. Robertson calculates their comparative value, and also
to the land on which they are fed.

‘ 5280 calves, each worth when reared, 2l.	.	.	.	.
5016 year-olds, each worth 4l. †	.	.	.	.
5016 two-year olds, at 8l.	.	.	.	.
1672 three-year olds, at 12l.	.	.	.	.
446 draught oxen, at 15l.	.	.	.	.
6236 milch cows, at 8l.	.	.	.	.
1159 cattle bought in at 10l.	.	.	.	.

24,825 beasts, worth each on the average 6l. 8s. . £

3733l.,’ and that the number of cattle has very much decreased, owing
oxen for the plough. In 1778 these parishes contained twenty-six ox-p
or twelve oxen to each, besides a greater number of smaller ploughs; b
they had diminished to eight ploughs.’

* The Statistical Account of Scotland, describing the parish of Banch
this county, gives a satisfactory illustration of the rapid progress of im
1758 that parish contained only two carts, in 1791 it could boast of 120.

† By year-olds, and two-year olds, is understood cattle that were of t
preceding spring; the price is calculated on the supposition of the catt
the stone weight, of 16 Amsterdam pounds, sinking the offal; and the An
which used to be the standard weight of that part of Scotland, containing
calculation supposes the cattle to sell at 3s. 8d. the Smithfield stone of

We make another extract from this work, which is not now to be purcha
be reprinted. He is speaking of the variation in the price of cattle. ‘T
varies here from year to year, like everything else, but, on the whole, has g
during the last fifty years. About the year 1740, the largest ox in the c
from 25 to 30 stones (Dutch weight, 43 to 51 stones Imperial weight), c
bought for 20s., or, at most, for 21s. They rose gradually in value til
1764, when cattle of that size, and as full fed as the country could mak
from 3l. to 4l., or from 2s. to 2s. 8d. the stone. From this period, cattle,
better fed, not only became larger in size, but were improved in condi
the increased demand for butcher-meat, combined with the gradual dec

se, or Leith markets. The butter is usually excellent, of an inferior quality *.

In 1792, brought up the price of half-fed cattle to the rate of 6s. 8d. the price at that time the price has risen and fallen alternately; in some years as high as 10s. a stone, and in others as low as 5s. or 6s.

A circumstance in the price of cattle is, that they are generally dear or cheap in proportion to the means of keeping them. Thus, in a year of plenty, when the crop of turnips with a luxuriant voggage, the price of cattle gets up; farmers can only afford to retain their cattle, but are compelled to do so, in a year of scarcity, again, particularly of winter food, the price of cattle comes even to the lowest pitch, the farmers being forced to part with them at the price they can get. In the great penury of fodder in 1807, some cattle were sold at the rate of 1s. a stone.—p. 440.

The introduction of *turnips* into Kincardineshire must not be omitted. It was first seen in this county about the year 1754, being introduced by Robert Paulding, on the farm of the Miltown, in the parish of St. Cyrus, which was the first; but he had few to follow his example for many years. In 1764, a farmer in Wattieston, in the parish of Fordoun, ventured to sow half an acre, at the time, was the greatest extent of them in any farmer's hand, and was sold chiefly in small parcels to his neighbours as kitchen vegetables, &c. It was not till about the year 1775 that they began to be generally sown. They are now universal over the whole county, insomuch that about one-third of the whole land in tillage is in turnips.

They are sown uniformly in drills; and this crop now forms the very basis of good husbandry, whether with respect to the succeeding crops, or to the feeding of cattle. It is applied, but more for the rearing than for the fully fattening of cattle. The population of the county does not require a tenth part of the fat cattle raised.—p. 460.

Of the 'cotter's' milch cow, and of the situation of the 'cotter' himself, Mr. Robertson gives an interesting description. He describes the cottages of the mechanics and little tradespeople, which are built of stone and lime, and consisting of two apartments, divided by a wall seldom more than six feet in height, and the roofing composed of straw, tied down with straw ropes, like a thatched roof, with its little garden or kale-yard; and many of them displaying a neat cultivation, and growing the different kinds of coleworts, of which the most prevalent, and forms the basis of 'old Scotia's kale-brose;' and leeks and cresses, and bushes of gooseberries and currants, and flower-bushes and honeysuckles,—and fine-smelling herbs, as thyme and lavender, and tansy 'to kill the worms,' and a sprinkling, too, of perennial flowers as cowslips, and yellow lilies; and, in some cases, an apple-tree on any side of the house wall, and house-leeks on the *riggin*. He goes on to describe the cottages of the farm servants.

The cottages attached to the different farms are more regularly disposed, being generally on the way-sides, in the neighbourhood, but not in the immediate vicinity of the farms. They are beginning to be constructed in a similar style, built of stone, and of an increased height in the walls; but the roof is still generally of straw, or of gray slate, and in a few instances of tile, which is the worst. The internal accommodation is simply, as it was wont, with two apart-

prevailing colour is black, but with more admixture of oth

ments divided by the furniture, but having now a grate in the fire-place, dow in the wall. These cottages have all a piece of garden ground for also a bit of potato land, along with the master's own field; a patch of what is best of all, a milch cow, that feeds in the fields along with the m and is otherwise not the worst fed of the whole herd. These good thing allowance of two pecks of oatmeal, and an adequate money-fee, which h 3*l.* to 12*l.* or more in the year, makes this class of peasantry the most vided for of any. They may not get rich, indeed, but they never fee
Recollections, p. 417.

* If this calculation of the number of cattle in Forfarshire be cons the average number tolerably correctly, and we estimate them at 7*l.* per of this division of live stock will be 317,800*l.*

The Rev. C. Peebles, in his statistical account of Mains, in Angus, a were not used for husbandry work in Angus in 1790. He draws a very rison between the farmers and their mode of management in 1760, whe to observe them, and 1790, when he wrote. The following are only a few which he touches:—

1760.

Land ploughed with oxen. Only a few horses kept to draw the harrow in seed-time, and bring in the common harvest. 7*l.* thought a great price for a horse.

Land rented at 6*s.* per acre, and only two small farms enclosed.

No English cloth worn but by the minister and a quaker.

Men's stockings were what were called plaiding hose, made of woollen cloth. The women wore coarse plaids. Not a cloak nor a bonnet was worn by any woman in the whole parish.

Only two hats in the parish. The men wore cloth bonnets.

There was only one eight-day clock in the parish, six watches, and one tea-kettle.

The people never visited each other but at Christmas. The entertainment was broth and beef, and the visitors sent to some ale-house for five or six pints of ale, and were merry over it without any ceremony.

Every person in the parish, if in health, attended divine worship on Sunday, which was regularly and religiously observed.

Few were guilty of any breach of the third commandment.

1790.

Oxen not employed in a mers have their saddle-ho 24*l.* to 30*l.*, and work-hors 25*l.* each.

Land at 30*s.* and all encl and thorn hedges.

There are few who do n cloth, and several the best

Cotton and thread stocki both sexes, masters and s have silk ones. The wo plaids have them fine and Silk plaids, cloaks, and b numerous.

Few bonnets are worn, a makers' trade is given up.

Thirty clocks, one hundr above sixty tea-kettles.

People visit each other seven dishes are set on the dressed. After dinner a la punch or whisky toddy is d then another bowl, then su that, the grace drink

Much lukewarmness prev to religious instruction, an inattention and indifference ordinances.

The third commandme almost forgotten, and pr greatly abounds

of Angus and Kincardineshire cattle are much the same, and better proportioned than those of the Buchan district, and more like those of the middle district. At three years of an Angusshire stot will be as well raised and sharp as at two years old, but not so strong in the horn. The cattle in the higher districts of Aberdeenshire are by far larger, and straighter out from the sides of the head, than those in the middle districts of Angus, while the Fifeshire is larger, more oval, and not so sharp at the point, as the Angus cattle.

Aberdeenshire cattle are rather smaller than the Angus, but the same. Those of Fifeshire are stronger, larger, and more like the Angus cattle.

Of the Angus horned cattle cannot be well ascertained, as the county to the proper age, and the difference in keeping great; but being so well proportioned, they will weigh more than the cattle of either of the above counties. They are preferable for feeding, having all the good qualities.

Of the Angus polled or *doddied* cattle, and which is now the most numerous and valuable breed of that county, will be treated when we treat of the polled cattle generally.

FIFESHIRE.

Fife is a kind of peninsula included between the river Tay and the Frith of Forth on the south, with Perth, Kinross, and Dundee on the east. The climate along the Frith of Forth is also mild along the banks of the Eden; but the west and north, in the neighbourhood of the Lomond hills, are chilly. In no county, however, is the character of the cattle so different. In few parts do they more decidedly unite the best qualities they possess. They bear evident impress of their Highland origin. There has been a cross which distinguishes them from all other. Dr. Thompson*, in his not altogether scientific or satisfac-

account of Scotland, under the article Dunichen, gives us no favourable opinion of the Scottish cow-leeches, when he describes the manner in which they were formerly in the greater part of Scotland installed in their office. 'Formerly, the farrier, who was also a farrier, was alone allowed to exercise his business on a parish. He had the exclusive privilege of doing all the blacksmith and farrier's work. He paid a small rent to the proprietor, and every tenant paid him a certain sum. About thirty years ago a person of this description had this sole right in Dunichen, for which he paid 1*l.* per annum yearly.

all the choice points. They are hardy, fleet, and travel docile, and excellent for work, whether in the plough or in use of oxen in husbandry, however, is much diminished even 1792, in Auchterderran, of the fifty-one ploughs which remained, seventeen were worked by horses, and now a would be found worked with oxen. There is a very great size of the Fife oxen, and this is to be attributed to the quality of the pasture, and the attention paid in rearing. When fed for the butcher, they generally weigh to sixty-five stones. They have been slaughtered at more than

They are far from unprofitable for the dairy. A good give from five to seven gallons of milk per day, or from pounds of butter, or from ten to twelve pounds of cheese per months after calving; while the cow is in milk for months.

Writers have amused themselves with many unsatisfactory as to the origin of the Fife breed. The Highland is disputed; but a southern cow or bull was certainly one of of this very useful variety of black cattle. Some say that William (James I. of England) received the news of the death of his father was compelled to set out on his journey to England without the means to make his triumphal procession sufficient; he hastily borrowed a considerable sum of money from some adherents in Fife. The English treasury, however, was not rich, or his private resources not such as to enable him to pay in specie; but as an honourable acknowledgment of the one of the greatest benefits he could confer on his former subjects, he gave them some valuable cattle from England. From what country or to what breed they belonged, neither history nor tradition

A more generally received opinion is, that in addition to the angel-nobles, which Margeret, the daughter of Henry VI. brought with her when she became the bride of James I. 300 English cows, a simple but invaluable wedding present by her father to the dowry. The progeny of these cattle remained of *Falklands*, because James and his young consort resided at Falkland palace, and to the park belonging to which this park-father was naturally conveyed. Here again tradition is the district whence these came. Cambridge claims the honour without pretensions better founded than those of many. There is no doubt, however, that at a considerably remote period the breed was materially improved by intermixture with some Scotch, and that the improvement commenced in the neighbourhood

to a judicious selection from their own*. The Fifes, never established themselves in the south, nor penetrated beyond the counties immediately contiguous. The district in favour of its native breed may partly account for more satisfactory explanation results from the fact, noted by agriculturists, and to which we shall often refer, that there is everywhere a kind of identity between the breed and the soil, which is always slowly, and in many cases, never acquired. This is a peculiarity in the management of the Fifeshire cattle. The dairy is particularly attended to, and from the account given of the quantity of milk and butter yielded by a cow, it returns a fair average profit.

As to breeding, the dairy is a secondary object. A few cows are kept to rear the calves, some of which are sent to taggers, or at the neighbouring markets. They are fed with milk and usually obtain every day $2\frac{1}{2}$, or three gallons of milk, or gruel, mixed with the milk, for ten or twelve weeks before they are weaned. The late calves are generally disposed of for sale, and the milk converted to the purposes of the dairy. The number of milk cows are calculated at about 10,000. Dr. Thompson estimates the whole stock of cattle, including lean ones, and others

never, in some cases, advantageously amalgamated. Mr. Adam Smith, in his Essay on Crossing, (Quarterly Journal of Agriculture, No. 1,) after observing that crossing can wear a more inviting aspect than the idea of uniting the qualities of the one breed with the hardiness and docile habits, and large size of the other, securing, as is thus imagined, a permanent value either of the parent stocks,' and acknowledging that 'the first experiments tend to confirm this hope,' yet 'cautions the breeder against over-riding such a system.' He relates, however, some instances in which the system has been carried to a very great extent. His account is as follows:—

Some time I had an excellent opportunity of observing, during three years, a breeding experiment, conducted upon an extensive scale by a gentleman of much experience as an agriculturist. His object was to obtain a mixed breed which should combine the good points of improved short-horns, and choice West Highland cattle. He bred from the short-horn bull and Highland cow, and had continued the experiment many gradations for ten or twelve years to the period when I last visited him. At this time my impression was, that the variety was fast returning to the original state. Many fine animals were brought to market.

Forrester, however, asserts, in his 'statistical account' of the parish of Forrester, in this county, that the breed of cattle has been much improved by crossing with the Lanark and the Holderness, and by winter-feeding on turnips. As we have asserted in the text, contrary to the experience of every farmer, the truth of the latter assertion there can be no doubt, for there are more applications of turnips in a breeding country than to the support of

Lindsay Crawford, of Crawford Priory, was unsuccessful attempts to keep the Durham breed, but she has now a beautiful cattle of this kind.

THE CENTRAL DISTRICT

THIS consists of Perthshire, Stirlingshire, Clackmannan and will not long detain us, as there is little distinctness of breed, and peculiarities of management.

PERTHSHIRE.

It would be difficult to point out any native breed of cattle. If it can be found in any district it is in the moorland part, where the attention of the farmer used to be chiefly directed to the rearing of cattle, for his ground was good for nothing else unless husbandry was introduced.† If we consider these as the native cattle, they are of an inferior kind. The highland origin

* The following account of the dimensions of a celebrated bull belonging to Devon may give agriculturists of other districts a more satisfactory idea of the proportions of the best Fife cattle:—

Length of the head	.	.	.	.
Do. from the root of the horn to the rump	.	.	.	.
Do. from the root of the horn to the top of the shoulder	.	.	.	.
Do. of the horn	.	.	.	.
Distance from point to point of ditto	.	.	.	.
Girth of the body at the shoulder	.	.	.	.
Do. do. before hough bones	.	.	.	.
Girth of the body fore leg, smallest part between the knee and hoof	.	.	.	.
Do. do. hinder leg at ditto	.	.	.	.
Do. do. fore leg, at fore spald	.	.	.	.
Height at the shoulder	.	.	.	.
Do. at hough bone	.	.	.	.
Do. from the shoulder to the breast bone	.	.	.	.
Do. of the knee-joint—fore leg	.	.	.	.
Breadth of the hough bones	.	.	.	.

† Dr. Robertson, in his 'Survey of Perthshire,' gives an eloquent defence of the system of sheep-husbandry introduced here, as well as a part of Scotland, and materially diminishing the breed of cattle. 'We ought not to forget the improvement occasioned by the sheep. They enrich the soil, and enlarge the quantity of grass within their walk more than any other species. They never deteriorate the soil; they render it more and more productive. As their numbers are increased upon a certain extent of land, they help to increase of numbers by producing an increase of food. The ground becomes green, and the heath extirpated by the enriching quality of their manure. Grass springs up spontaneously where it had formerly been scanty and scarce. This powerful top-dressing of our whole hills with sheep-dung and

, and even the long-horns have found their advocates. e many of the midland counties of England, presents a y breed, varying according to the soil, or the description of e whim of the occupier.

em of grazing is pursued in some parts of the county, and the grazing districts. Highland stots are bought in at the , and fed during the winter, for the May and June markets. d out on the *foggage*, or pastures that have been mown, e or end of December, according to the severity or mildness

Then a little straw with bog-hay is carried to them, and June of the following year, they pursue their course south- to the farmer a profit of 30s. or 2l. per head.

the number of cattle which the county contains it stands at statistical account assigns to it more than 79,000. The ever, of late materially improved, although they have not distinguishing character; and the dairy cattle, in the midland nty, have taken somewhat the start in the career of improve- oxen are worked in the plough, but none on the road.

ndry has advanced as rapidly in this country as in the ones, and the bleak mountains of Perth are nearly aban- heep; on the other hand, the management of cattle, both and dairy districts, is materially improved. In the Carse re there is much arable land, the usual stock of the farm fficient to consume the straw. Young cattle are therefore the neighbouring markets, which are kept in the winter urnips, and in the following May are sold to the dealers,

is little doubt that the Grampians will be as verdant as the Ochils, ad once as forbidding an aspect as the Grampians.'

re with this, an account given of the management of cattle on the five years ago ('Farmer's Magazine,' 1807.) Formerly the cattle stock e very much neglected during winter, no provision of succulent food, hing excepting straw, being made for them. In the spring this was upon the cows in calf. They were sometimes so debilitated as to be th; and frequently contracted diseases under which they laboured for which they never recovered. I well remember the poor wives during ast winds in May, provincially called the *Cowquake*, tending their cows, on, and covered with a blanket, while they picked up any spring grass o rise in the kail-yard, or at the bottoms of walls or banks; and to such ey reduced at times, that I have heard of their taking the half-rotten fs of houses, and giving it to the half-dead animal, as the means of rable existence. On this account the half of them did not take the t did were too late for rearing stout calves. The yeld cattle were so was always the end of the season before the heath, and steril, hidebound r were depastured, brought them into such condition as would now be alf-fat.

properly sheltered by slips of planting.

STIRLINGSHIRE.

THIS is far more a grazing than a breeding county: indeed of the farmers is confined to grazing, to the exclusion of all else, the very plough being chiefly used with a view to turn their cattle during the winter. The pastures of Stirling are natural and artificial, are exceedingly rich; and from its position it is the first convenient halting place for the Western Highland cattle during the winter. Many of the Stirlingshire farmers purchase the best Argyle beasts about the beginning of summer, and turn them to their natural or artificial pastures, on which they are made ready by the end of autumn.

The *carses* extending from Stirling to Boness can boast of not exceeded by any in Britain, and they are almost entirely open and to the west of Falkirk, large tracts of land are farmed either to residents in the neighbourhood or to speculators, and butchers from a considerable distance. The summer feed is good, and, except in a year of extreme scarcity, the winter feed of stocks of sheep and cattle bought in at the trysts is excellent.

In the statistical account of Fintry, in this county, how it is made of Mr. David Dun, who established, if he did not improve, a mode of grazing, and which has been adopted in a large portion of the west and south of Scotland. His principle was to buy from the choicest cattle in order to stock his farm, and to feed them in a lighter manner than farmers had been accustomed to do, *i. e.* to put less upon his land than had been usual; and the consequence

* In the statistical account of Longforan, in the county of Perth, is given of the manner of fattening calves. 'They are fed in a box made of very coarse boards, $4\frac{1}{2}$ or 5 feet long, and 4 or $4\frac{1}{2}$ high, and in proportion to the breed to be fed. The boards of which the box is made are so close to one another, as to let in sufficient air, but no more, as the ventilation is one essential part of the process. It stands upon four feet, and is slanting to drain off all wetness, and the bottom should be covered with straw, which should be changed twice a week. The calf is put into this box as soon afterwards as possible, and for the first week milk is given sparingly, after which the milk is given more freely, and when about ten days old then gets as much sweet milk fresh from the cow as it can take three times a day. A large piece of chalk is hung in the box, which it occasionally licks. This is repeated once a week, and it becomes fine veal in ten weeks. If it is put in at about a week old, otherwise the veal will neither be so good, nor so

materially improved.

There have been, since the year 1817, chiefly of the Ayrshire mostly pure; for a cross between the Ayrshire and the other breeds has not generally succeeded. On the ground of some cottager, of the mixed breed will occasionally be found yielding milk and tolerably good in quality, and afterwards fattening scarcely inferior to the true Highlander. The cattle that are put to summer fattening are out day and night; but the milch cows are housed during the night, while by other farmers they are kept out by soiling during the heat of the day, and turned out at night.

It is formerly much used in Stirlingshire; but, very few teams are now to be seen in that part of the country. The average number of cattle in Stirlingshire, including the flying stock, is rather more than 19,000.

The situation of Stirlingshire with regard to the breeders of cattle from the northern and western counties, and the buyers or dealers from the southern and eastern parts of Great Britain, cause it to be selected for the export of cattle.

It is commonly calculated in these districts by the stone, *tron*, which con- tains 14 lbs. each, and, consequently, the weight of the beast was equivalent to 14 stones Imperial weight, or 14 lbs. each, or exactly 143 stones Smithfield weight.

Mr. Macpherson, in his statistical account of Campsie, gives the following particulars in that parish in 1793:—'Milk cows 749, which, within the last few years, have increased considerably in bulk, hence they have a tendency to be in milk; they, however, give on the average from seven to eleven pints of milk; below seven they are not thought worth keeping for the dairy; the milk is considered remarkable. From eight Scots pints nearly one pound of butter is made, and the cheese is equal to that of Dunlop. Besides these there are 345 fat cows, and young beasts for the Falkirk market and the butcher, which are mostly grazed next summer for the butcher, 345. The winter pastures are in the fields during the whole winter season, and are fed once or twice a week with hay gathered in autumn among the cows' feet in their pastures. The grass is cut for fodder, as they term it, about Christmas, (it is considered to be the best time,) and they are forced to begin before Christmas, and continue till the spring when the cattle refuse it. There are few cattle grazed but Highland cattle from Argyleshire are preferred. North country cattle are rejected, because they are sour, and difficult to feed.'

Mr. Macpherson also gives a calculation of the consumption of animal food in this parish. 'In 1759, 100 oxen were killed for winter-beef in the whole parish, the gentry excepted. The farmers joined, and got a cow for a winter-mart, the price then being 10 shillings for a fat cow. In 1759, very decent farmers thought it necessary to kill one fat cow, or a few sheep, salted up for winter store; and in 1794, three oxen were killed annually about Martinmas time, for winter provision, beef, and lamb, killed through the season; and few of the tradesmen had without fresh meat on the table, and malt liquor to drink.'

particularly in that of Kinross; seven thousand have sold at this distillery in one year. The ordinary stock of Kinross that of Clackmannan nearly 1400, exclusive of those in the dairy. The cattle husbandry of Kinross has been materially improved within fifty years. The soil of Clackmannan is more fertile, and of a superior description.

THE SOUTH-WEST LOWLANDS.

THIS district consists of Dumbartonshire, Renfrewshire, Lanarkshire. It is a manufacturing district, and very thickly populated. Although occupying only one-thirteenth part of the extent of the kingdom, it contains full one-fourth of the inhabitants; many cattle are wanted for the butcher and the dairy. The soil and the climate are admirably adapted to the rearing and fattening of live-stock of a valuable breed, and particularly of dairy cows, is not to be surpassed in the whole kingdom.

* The tryst used to be held on a large common in the immediate vicinity of Glasgow, but which is now enclosed, and a field in the neighbourhood of Stenhouse has been selected. It is about three miles from Falkirk, on the other side of the Glasgow canal, and is the property of Sir Michael Bruce. The road to it is not uninteresting; it is close to the celebrated Carron foundry, and the sheet of water above the works, and the woody winding way between it and the city is very pleasing, while the traveller is but a little way from two spots connected with the early and later Scottish history—the peace concluded between the Romans and the Picts, and the concealment and escape of the hero Wallace.

The field, or the toll at its entrance, is let to a *taxman* at 120*l.* yearly, 8*d.* for every score of black cattle, 3*d.* for every score of sheep, and 1*d.* for every score of horses. There are, beside, several tents erected on the field at which refreshments are sold, or where business is transacted, and money paid and received; for every score of these the taxman receives 13*s.*

At the last October tryst (1832) there were, on the lowest computation, 50,000 black cattle, 30,000 sheep, and 3000 horses. It is worth going to witness such a collection of beasts, and including every variety of every breed. It is a school for the agriculturist, from which he will not fail to derive many valuable lessons; and then, in the latter part of the day, when the tryst is over, the farmers, not only of the flat muir, but of the beautifully undulating ground about Glasgow, bring their cattle and sheep, and the herdsmen in their characteristic Scottish dresses, sit on their plaids and resting for a while their wearied limbs—but still waiting for the evening, when they break up into groups and relating the occurrences and bargains of the day, which the agriculturist will not soon forget, and to which no one can be indifferent.

The October is the largest tryst, for all the cattle which the farmer wishes to sell before the winter are then brought forward. In the three trysts there are sold more than 80,000 cattle, 50,000 sheep, and 5000 horses, and, averaging the price at 7*l.* each, and of the sheep at 18*s.*, and of the horses at 10*l.*, their gross value amounts to 650,000*l.*

cultivated ground, of which there is a great deal. The grass
rse, but it will be eaten by cattle that have not been accus
ing better; and it is generally contrived that some part of it
sheltered from the blast. Many West-Highlanders, and
Argyle, are purchased in October or November, and chiefly
ket, and they are turned in the wintering grounds * without
ender, until the winter thoroughly sets in, and the ground
h snow; they are then fed on coarse hay or straw given
some sheltered spot. It is thrown carelessly down, and
east gets the better share, and part of it is trodden under
d.

ten barely sufficient of this coarse hay and straw to last
er of moderate length, and, therefore, after one of unusual
ttle, although not so reduced as we have described them to
ts of the Highlands, are brought to market in poor con-
at a very inferior price.

are wintered in the straw-yard, but they fare not much
rarely get turnips, they have straw only, or this coarse
they do not thrive so well upon it as if they were turned on
anty as it is.

May they are usually sold to the dealers, who drive them

They are generally two-year-olds who go through this
e owner of the coarse pasture is fairly repaid by the growth
nd the greater price which beasts even of the same size
above that which would be given for them in November.

nces the succession of journeys and stages of improvement
proportion of the Highland cattle pass through. Messrs.
cfarlane thus speak of it in their 'Survey of Dumbarton-
reader will perceive here some traces of that extensive
labour, in the management of stock and the application of
which is at once most profitable to individuals, and econo-
blic. The cattle bred in the West Highlands are, at the
ars, or two years and a half, removed into Dumbartonshire
pouring counties. At three years old they are carried to
unties of England, and so by degrees southward, enjoying

ing grounds are usually bog-meadows, which are formed by the filling
posits of water, in consequence of the gradual accumulation of vegetable
, at length, attain a sufficient degree of solidity to bear the cattle. The
of the coarsest nature, but it gradually improves, and, although sheep
omes a valuable part of the farm, and the chief support of the cattle both
nter. On the edges of most of the high sheep-pastures, there are slips
on which the sheep will not feed, but on which cattle readily thrive.

Some cattle are fattened altogether in Dumbartonshire originally bred there. These also are West Highlanders. although coarse, is abundant and nutritive (for these often yield much good produce), the cattle remain on the or they are removed to other fields that are not so close and when the flush of grass comes, they grow and fatten rate.

Some of the farms do better for summer than for winter then the Highlanders, or some old oxen or cows, are bought from the neighbours, or at the surrounding markets, and turned on the grass, which is changed, in due time, for the aftermath or, in a few instances, they are turned at once into the be a portion of it can be spared from the cows. In November for the butcher, and average from twenty-five to thirty stones on this summer-grazing varies in different seasons, but is computed at less than 50s. per head.

In a few parts of the country the North Highlanders have been as being cheaper than the others, but they have not fattened so well repaid the prime cost, and expense of keeping.

Stall-feeding has been introduced, and has answered well as consuming the better kind of grass to much greater advantage than it were eaten down; and likewise converting the turnip crop to profitable use. On rich ground, and with much artificial manure, this method of feeding which will gradually supersede the present method of feeding in the field; but, in a district like this, the coarse grass and the turnips are not to be in any other way consumed than by the old method, and more particularly of winter feeding.

The Highlanders never answered for the dairy, and therefore are not to be kept for this purpose in so populous a county as Dumbartonshire, more especially the small and inferior variety which pass under the name of the native cow. Some attempts have been made to improve with the Fife, and afterwards with the Ayrshire cattle, but have not perfectly succeed; and the true Ayrshires have gradually supplanted themselves in the greater part of the dairies. They used to be brought from the neighbouring counties of Renfrew and Ayr, but now most of them are now bred in Dumbartonshire, and are in no way different from the original stock; or rather, when properly managed, they are well adapted to the dairyman, for it is not often that a cow will thrive in the country, or yield so much milk as in the country, and even when she was bred: and, most certainly, in cases of disease, the cow is lost much oftener than the one that is breathing her

and the whole of the district including part of Stirling-
is much indebted to the patriotic exertions of the Duke of
Grace's factor, Mr. Geekie, informs us, that as late as the
dairy cattle was of a very inferior kind,—small, coarse,
possessing few of the qualifications requisite in a dairy
ke of Montrose and the principal landed proprietors of the
ned themselves into a society, for the express purpose of
of cattle, and the introduction of the Ayrshire breed.
were offered for the best bulls and cows which had been
district. Liberal donations were added by the Highland
nd. Great emulation was thus excited among the tenantry,
effect was produced of introducing many excellent animals
d Lanarkshire; their progeny became naturalized here,
sons just stated, they are even more valuable than the ori-

of a good Ayrshire cow, bred in Dumbarton, is fully equal
y any of its progenitors. Mr. Geekie thus averages it:—
t three months after calving, 10 Scots pints daily.

ond	.	.	.	8	„
d	.	.	.	3	„
t six weeks	.	.	.	$1\frac{1}{2}$	: she is then dried;
l the year round,				$5\frac{1}{2}$	Scots pints, or nearly 3

r the dairy are generally taken from their dams as soon as
l with milk from the hand for about two months, the quan-
g gradually decreased when they begin to take other food.
ven in small quantities in order to keep the bowels in a
le under milk. Where there is other demand for the milk,
ur are gradually mixed with it or substituted for it. After
aned they are turned on good pasture, and during the first
ed, and fed on oat-straw or meadow hay, with, at least
y, some turnips cut and mixed with the dry food.

second summer they should have better pasture than they
they will not be raised sufficiently in size; and in the
ey are generally, and always should be, housed: a few
ho study their own interests, as well as the comfort of
w them some turnips in addition to their straw and hay.
mer inferior pasture is sufficient, or they will get too fat,
winter they should be well kept, and particularly in the
they have calved.

ree years old will weigh from twenty-eight to forty five

thirteen acres; so that a sufficient number only are kept for the

the dairy, and scarcely enough for the consumption of beef.

The Highland cow is rarely met with; she has been proposed by the dairy cow of Scotland, the Ayrshire*. The Alderney promising to be valuable in a dairy county, from both the quality of her milk, but she was not found to answer. She was tried but with no success, by the native bull. The Durham was attempted, and the Alderney crossed with it; but, except on a small scale, all have given way to the Ayrshire. The Ayrshire breed has been materially improved in Renfrewshire within the last twenty years, much, perhaps, in size as in fineness of bone and beauty of form. It was long a very great error in the Renfrew system of management, that fifths of the calves were sold almost as soon as they were dropped. The stock was kept up by purchasing from Ayrshire. It is the quality of the milk of the cow was thus preserved, and that was an object of great importance in a dairy country; but the breed of cows in Renfrewshire has to a certain degree. The farmer did not systematically rear the best cows which from experience he knew to be the best, and the want of improvement of his stock, but he trusted to the chance of purchase. It was a perfect uncertainty, whatever judge of cattle he might be, in proposing him to be always so fortunate as to select a good one. When he moved her from her native place, and, with the exception, perhaps, of the Ayrshire cow, oftener than any other, he had, to a much greater extent, some imagine, lessened her value. To a considerable extent this has been rectified; but there are still yet too many dairy farmers who are more to present convenience and profit than to distant and certain advantage.

A great deal of the milk supplies the dense population of Glasgow, Greenock, and also of Glasgow, which is close on the border of the county. The remainder is manufactured into butter, which is sold to the other towns are supplied, and which is often made into cheese instead of waiting for the separation of the cream. The reason is not to the making of cheese, than which Scotland cannot produce more. It is known under the name of the Dunlop cheese, but no more of it has for some years past been made. The greater part

* The Rev. Mr. Maxwell, in his Statistical Account of Kilbarchan (1793) unknowingly proves that the Ayrshire cow was early introduced here when the cows most esteemed here are those of a small mouth, head and neck. With respect to colour, those spotted brown and white are preferred. M'Lachlan, in his account of Mearns, in 1796, says, 'Most of the cows are of middle size, and of a brown and white colour. They give from ten to fifteen pints of milk per day.'

quantities carried to the neighbouring shires; and
ve property in Lockwinnoch parish, which belong
were paid in *sticks* and *cheese*.*

men manage their cattle better at calving time than
re, for while they are allowed potatoes with their
he quantity of succulent food is increased as the
ches, in order to prepare for an increased flow of
ed for the calf, is profitable to the dairyman.

et three gallons of new milk daily for about two
put on young grass for six months, and upon
next eighteen months; after which, when supposed
d along with the dairy cows. The summer feeding
sts chiefly of grass in the field, with vetches or
he winter feeding consists of turnips and potatoes
chaff or cut hay, or the turnips and potatoes
and meadow hay. In spring, bean-meal is fre-
nese. Near distilleries a great deal of draff and
ns.

gricultural Society, which holds its annual meeting
uted very materially to the improvement of the

AYRSHIRE.

ong the eastern coast of the Firth of Clyde, and
Renfrew to Wigtownshire, by the former of which
orth, and by the latter on the south, while it has
s, and Lanark on the east. It is necessary to
at the reader may better comprehend the rapid
ire cattle over all these districts. The climate is
e soil, with its produce, is calculated to render it
in Scotland, and equal perhaps to any in Great

ting of the parishes of Kilmalcolm, Port Glasgow, Greenock,
ire, and Largs, in Ayrshire, has since started in honourable
f the Highland Society. The show is held at Greenock in the
0, one hundred guineas were distributed in prizes for the best
e: 89 Ayrshire cattle, 12 West Highlanders, 28 sheep, and
aking a total of 166; and the number of competitors was 57.
e, 18 West Highlanders, 86 sheep, and 40 horses were exhi-
competitors. In 1832, 110 Ayrshire cattle were shown,
sheep, and 33 horses:—total 317; and 63 competitors. For
branch society, we are indebted to Claud Marshall, Esq., of
ber of the parent one.

valuab
bandry
shire c
as follo
'Hee
but sm
conside
toward
light;
loose a
hips, v
short,
forwar
and pr
distanc
The he
general
Mr.
dairy-b

* It m
agricult
'Survey
county;
or fire-pl
wretched
serpentin
with wat
esculent
except a
available
with oats
surplus
overrun
was eve
from th
or drov
enclosu
the catt
in const
poor ca
summer
let for t
credit to
† Mr
the thig
teristic

bandry generally, that has yet been published,) thus describes the shire cattle (p. 26)—‘The *shapes* most approved of in the dairy breed are as follows :—

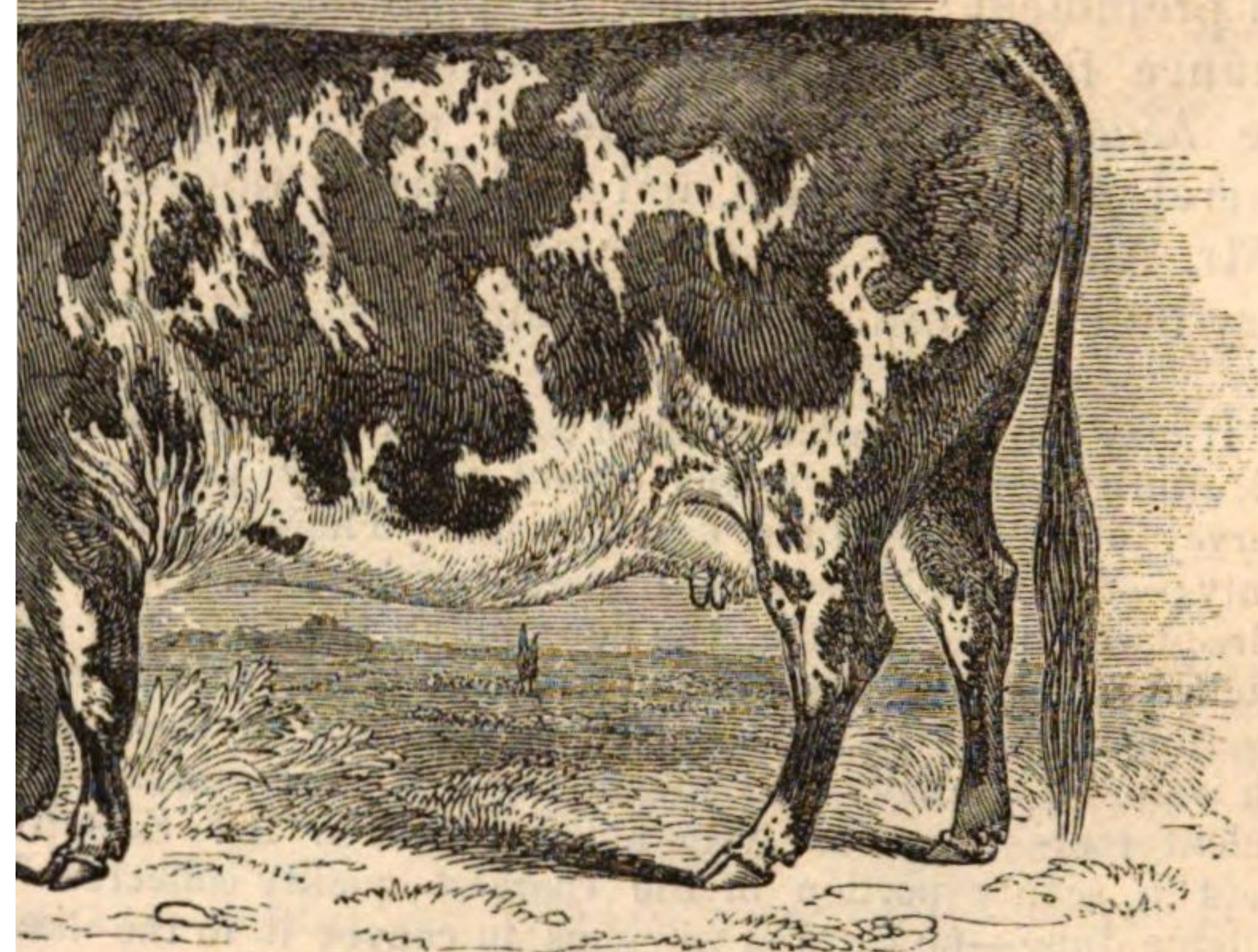
‘*Head* small, but rather long and narrow at the muzzle; the *eye* but smart and lively; the *horns* small, clear, crooked, and their roots at a considerable distance from each other; *neck* long and slender, tapering towards the head, with no loose skin below; *shoulders* thin; *fore-quarters* light; *hind-quarters* large; *back* straight, broad behind, the joints loose and open; *carcase* deep, and *pelvis* capacious, and wide over the *hips*, with round fleshy *buttocks* †. *Tail* long and small; *legs* small and short, with firm *joints*; *udder* capacious, broad and square, stretching forward, and neither fleshy, low hung, nor loose; the *milk veins* prominent; *teats* short, all pointing outwards, and at a considerable distance from each other; *skin* thin and loose; *hair* soft and well set. The *head*, *bones*, *horns*, and all parts of *least value*, small; and the *general figure* compact and well proportioned.’

Mr. Aiton also informs us, that ‘the Ayrshire farmers prefer dairy-bulls, according to the feminine aspect of their heads and necks.’

* It may not be uninteresting to contrast the present improved state of agriculture with what it was eighty or ninety years ago. Colonel Fullerton’s ‘Survey of Ayrshire,’ thus describes it:—‘There was scarcely a practicable road in the county;—the farm-houses were mere hovels moated with clay, having the open hearth or fire-place in the middle, the dunghill at the door, the cattle starving, and the people wretched. The land was overrun with weeds and rushes, and gathered into high serpentine ridges—the soil collected on the top of the ridge, and the furrow was filled with water—no fallows—no green crop—no sown grasses—hardly a potato, or an esculent root—no garden vegetables, unless a few Scotch kail; little straw; and except a scanty portion of the coarsest quality collected from the bogs—little available dung—no carts or waggons to convey it to the land, but the ground sown with oats after oats as long as it would pay for seed and labour, and afford a surplus of oatmeal for the family, and then was left in a state of absolute sterility, overrun with thistles, until rest again enabled it to produce a scanty crop. No manure was ever spread on the out-field; the starved cattle were suffered to poach the land from the end of harvest until the ensuing seed-time,—thus the natural grass was either killed or drowned with water standing in the cattle’s footsteps. As there were few enclosures, the horses were either tethered during the summer months, or loose as the cattle, but under the tendancy of a boy and a cur-dog, and the poor animals were in constant agitation, and impelled by starvation to fly from their bare leys. The poor cattle, starved during the winter in the houses, and perpetually harassed in summer in the fields, were never in a fit condition for the market; the finest land let for two or three shillings per acre; and there was neither skill, capital, industry, or credit to do away all this wretchedness.’

† Mr. Rankine very properly remarks, that, ‘compared with other improved breeds, the thighs, or what are called the twist of the Ayrshire cow are *thin*. She is, characteristically, not a *fleshy* animal.’

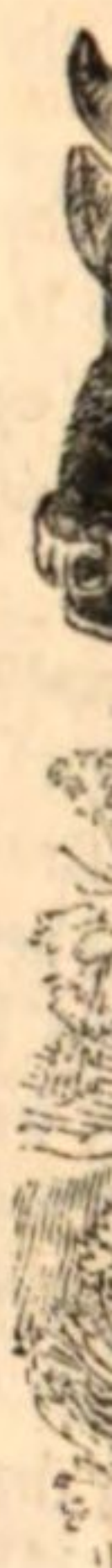
those of Ayrshire generally possess. The most a dairy-cow can possess is, that she yields much milk of a rich or butyraceous, or caseous nature, and that after yielding large quantities of milk for several years, she shall retain as any other breed of cows known; her fat shall be distributed through the whole flesh, and she shall fatten faster than any other is high praise, and if it can be truly affirmed of her, we are naturally anxious to know the origin, history, and the general management of this valuable



[*The Ayrshire Cow.*]

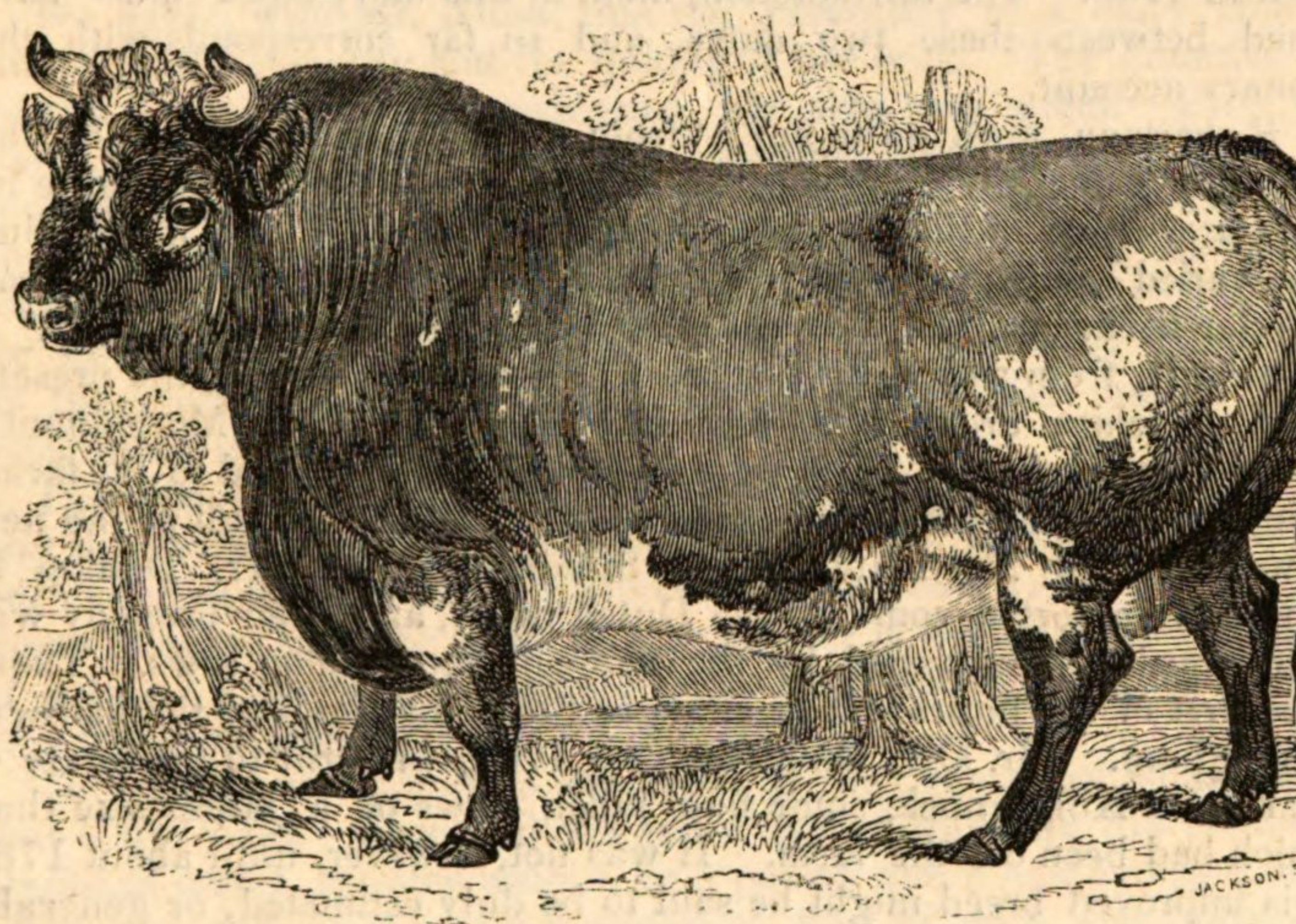
The Ayrshire cow is even at the present day a matter of dispute. It is certainly known about her is, that a century ago there was no such thing as an Ayrshire, or Ayrshire, or Scotland. Did the Ayrshire come from a careful selection of the best of the native stock? or is it a circumstance unparalleled in the history of domesticated animals, that the breed may be ameliorated by careful selection, its qualities greatly increased,—some good qualities—some of its qualities for the first time developed: but yet there will be no doubt of the original stock, and the more we examine the history of the breed, the more we can trace out the characteristic points of the breed, and the more we can improve one of them improved.

they
milk
could
day,
calvin
that
were



If M
the bre
resemb
from a
when v
tiveness
peculiar
bellying
it would
While t
breed, h
a fortun

they then were, could be of great weight, well shaped, or yield milk. Their only food in winter and spring was oat-straw, and what they could pick up in the fields to which they were turned out almost every day, with a mash of a little corn with chaff daily for a few weeks before calving, and their pasture in summer was of the very worst quality; that coarse pasture was so overstocked, and eaten so bare, that the cattle were half-starved.'



[*The Ayrshire Bull.*]

If Mr. Aiton's description of the present improved Ayrshire is correct, the breed is very much changed, and yet there is so much in its appearance that resembles the native breed, that a great deal of it must have been done by careful selection from among the native cattle, and better feeding and treatment. When we look closer into the matter, the shortness, or rather compactness of the horns, their width of base, and awkward setting on the head; the peculiar tapering towards the muzzle; the narrowing at the girth; the bellying; and the prominences of all the bones—these are features which it would seem impossible for any selection from the native breed to produce. While therefore the judge of cattle will trace the features of the native breed, he will suspect, what general tradition confirms, that the present breed is a fortunate cross, or a succession of crosses with some foreign

unt of "*The Husbandry of Ayrshire*," which was whose authority is of considerable weight in every-tes, that a gentleman of long experience, Mr. Bruce this breed was introduced by the late Earl of rl of Marchmont alluded to must have been that pbell, who married Margaret Campbell, heiress of arish, and who became Earl of Marchmont in 1724, e introduction, then, of this dairy-stock must have ese two dates, and so far corresponds with the

s on to say, 'from what particular part of the ere appears no evidence. My own conjecture is, the Holderness breed, or derived from it; judging or, from somewhat better evidence, the small head hich they bear a striking resemblance to them*.'

hich, by crosses with the native breed, the present ose, were first introduced on Lord Marchmont's e. They were soon afterwards carried to the farms nobleman at Sornberg in Kyle. A bull of the new r. Hamilton of Sundrum; then Mr. Dunlop in some of the Dutch cattle, and their progeny was uished by the name of the Dunlop cows. These proved, or stranger breed that reached the bailliery Orr, about the year 1767, brought to his estate of lock, some fine milch cows of a larger size than the farm. It was not, however, until about 1780 ed might be said to be duly estimated, or generally

r, have maintained that they were produced from the native ey bull. It requires but one moment's inspection of the ani-is supposition is altogether erroneous.

Cow-doctor,' published at Glasgow, in 1794, the following shire cattle at that time—'They have another breed called re allowed to be the best race for yielding milk in Great r for large quantities, but also for richness in quality. It is ls brought from the Island of Alderney, with their own cows. ot weighing more, upon an average, than from 24 to 30 stones. more milk daily than any other kind of cattle, when a just size and pasture. They are much leaner and thinner than English breeds, when in the best grass. They are not deemed out rather the contrary, being shaped more like the Dutch ves of Scotland. Their horns are small, and stand remark-r is generally pied or of a sandy red, varying in this from all

an
sus
bea
adm
seco
the
acco
dair
W
mate
by t
dail
mor
the
four
for s
as th
enter
Th
and t
per g
Some
of ca
into
Th
that
poun
when
worth
theret
* M
numb
ages
Recoll
other
gentle
would
dairy-c
the sto
the ett
1200 t
bring
the da

suspected, and not without reason, that an attention to the sh beauty, and an attempt to produce fat and sleeky cattle, which admired at the show, has a tendency to improve what is on second point—their quality as grazing cattle,—and that at the ha the certainty of diminishing their value as milkers. The st account assigns 61,000 cattle to Ayrshire, of which more than dairy-cows. The average will be one beast to every fifteen acres *.

We agree with Mr. Aiton, that the excellency of a dairy cow mated by the quantity and the quality of her milk. The quantity by the Ayrshire cow is, considering her size, very great. Five daily, for two or three months after calving, may be considered more than an average quantity. Three gallons daily will be gi the next three months, and one gallon and a half during the suc four months. This would amount to more than 850 gallons; but, a for some unproductive cows, 600 gallons per year may be con as the average quantity obtained annually from each cow. W enter more into this presently.

The disposal of the milk varies according to the situation of th and the character of the neighbourhood. If it is sold as new milk per gallon at the first hand, the produce of the cow will be 20*l.* per Some imagine that the profit will be greater if employed in the fa of calves. Others, at a distance from any considerable town, co into butter or cheese.

The quality of the milk is estimated by the quantity of butter or that it will yield. Three gallons and a half of this milk will yield a pound of butter, country weight, or a pound and a half avoirdupo when one gallon of water is added to four of milk, the butter-worth to the farmer, or will sell at, 2*d.* per gallon. An Ayrshir therefore, may be reckoned to yield 257 English pounds of but

* Mr. Robertson, who, in 1819, examined all the farms in Cunningham, f number of milch cows to be 12,563, and that of *yell* cattle (those not in mil ages to be 8991, making a total of 21,554. 'I should conceive,' he says—*Recollections*, p. 573,')—'that not more than the odd 1554 would be Highland other *yell* cattle, bought in at Dumbarton, or other Highland fairs for gr gentlemen's parks, or in cattle-dealers' pastures for feeding or for sale; and that would be of the native breed of Cunningham, and consisting of about 437 bulls dairy-cows, and 7000 young cattle of all descriptions under the third year for kee the stock. Of these a very considerable proportion are annually sold, and partic the *etterlins*, or quays in calf in their third year, and also of milch cows of all age 1200 to 1500 cows are sold annually out of the county in Cunningham alone bring a very considerable price, and this probably, combined with the yearly pr the dairy, is, perhaps, little less than the amount of all the land-rents.

ner takes the whole charge of the milking, and the
 l of the butter, or milk, or cheese, or whey, as he
 ries from 8*l.* to 15*l.* In the neighbourhood of
 eraged at 15*l.*; and if to this be added the wages
 d for every eight cows, the whole expense of the
 ne money received, at 10*d.* per gallon, for 600
 there will result only 7*l.* per annum profit on each
 at the milk of the cow is fairly disposed of without

Mr. Aiton rates the profit of the Ayrshire cow

two English quarts. An Ayrshire pound consists of 24
 pounds, or 24 lbs. avoirdupois, make a stone. Mr. Fullar-
 nt of Dulry,' in this county, states that in 1794, before
 oved Ayrshire cow, each cow would yield, on the average, in
 tones, or 288 lbs. of sweet-milk cheese.

nducted at the Earl of Chesterfield's dairy at Bradley-Hall
 height of the season, the Holderness would yield 7 gallons
 nd the Alderney, 4 gallons 3 quarts; and the Devon, 4 gal-
 n this was made into butter, the result was, from the Holder-
 Devon, 28 ounces; and from the Alderney, 25 ounces. The
 day, and from that is produced 34 ounces of butter.

curious extract from the farm-book of Mr. David Blair, of
 dated 1743:—

ned 7 cows at 8 pounds each (13*s.* 4*d.*, the Scots pound being
 ntered to the milk on the 21st of May, to the end of harvest.

cheese 9 $\frac{3}{4}$ stone, at 2 <i>l.</i> 0 <i>s.</i> 10 <i>d.</i>	.	.	.	.	.	£19	10	0
13 <i>s.</i> 4 <i>d.</i>	.	.	.	.	.	18	0	0
se, at 1 <i>l.</i> 6 <i>s.</i> 8 <i>d.</i>	.	.	.	.	.	15	6	8
ouse	.	.	.	.	.	6	0	0

Scots £58 16 8

sweet-milk cheese to Glasgow, in a compliment.'—*Rur.*

s. 8*d.* Scots, or 4*s.* 8*d.* by her bargain, and the system of
 gain attempted during the period of thirty-six years, which

as showing the improvement of the Ayrshire cow since that
 aken at the very height of the season; and yet, reckoning
 of butter, or 4 $\frac{1}{2}$ pints for a pound of cheese, and that the
 they scarcely yielded 3 pints (1 $\frac{1}{2}$ gallon) each per day. It
 oes not now yield three times that quantity.

from 1729 to 1765, also records the amount of wages:—

1729—1742.	1743—1759.	1760—1765.
£2 13 4 ..	£3 6 8 ..	£3 10 0 to £5 0 0
1 6 8 ..	1 10 0 ..	1 10 0 to 2 0 0

that part of the country, the wages were as follows:—

1796.	1828.
£12 0 0 to £16 0 0	£14 0 0 to £18 0 0
5 0 0 to 6 0 0	6 0 0 to 9 0 0

who
 emb
 main
 not
 the c
 at 15
 shire
 2160
 milk
 am c
 dera
 town
 900
 turne
 neous
 requir
 110 o
 far ab
 applie
 believ
 850 g
 from
 weeks
 there
 and s
 one o
 instan
 'I c
 querie
 intelli
 dairy
 stock
 being
 highe
 He st
 Scots
 that in
 an Ay
 skimm
 gallon
 And
 stock

whose observations, with which we have been privately favoured, were embodied in our account of the Ayrshire cattle, very justly, we maintain that Mr. Aiton's statement is far too high, and his calculations not well founded. 'He deduces his statement,' says Mr. Rankine, 'from the circumstance of some farmers letting the milk of their cows for at 15*l.* and 17*l.*, which, taking 60 pints (half-gallons) to produce an Ayrshire stone (24 lbs.) of cheese, and the price being 10*s.*, would require 2160 pints for each cow. But he is not warranted in inferring that the milk from which these rents were paid was all converted into cheese. I am convinced that no such rents were ever paid for cows where a considerable portion of the milk was made into cheese. In the vicinity of Glasgow, where the whole of the milk could be sold for 4*d.* a pint (half-gallon), 900 pints would bring 15*l.* Where the whole of the milk could have been turned to such an account, such rents might have been paid; but it is not necessary to calculate the quantity of milk given from the quantity of cheese required to enable a rent of 15*l.* to be paid. His first statement (No. 110 of this work) that 1200 Scots pints (600 gallons) are yielded, is far above the average of all the cows in the county, may be too low when applied to the best-selected stocks and on good land, but I have reason to believe that no stock of 20 cows ever averaged 1800 or 1700 pints (850 gallons) each in the year. I have seen eighteen pints of milk from a cow in one day. I had a three-year-old quey that once, six weeks after calving, gave 14 pints a day. The dairymaid predicted that there "had been o'ermuckle talk about her, for ony luck to come o' it," and she soon afterwards received an injury in her udder, which prevented one of her quarters to become dry of milk. These, however, are exceptional instances.'

'I quote with confidence,' Mr. Rankine proceeds, 'the answers to the queries which I sent to two individuals. The first is a man of superior intelligence and accuracy, and who has devoted himself very much to dairy husbandry. He keeps between twenty and thirty cows, and his stock has for many years been the handsomest I ever saw, and his cows being close to a small town, he had every inducement to keep them in the highest condition that is requisite for giving the largest produce in milk. He states that, at the best of the season, the average milk from each cow is 64 Scots pints ($4\frac{1}{2}$ gallons), and in a year 1300 Scots pints (650 gallons); that in the summer season 64 pints (32 gallons) of entire milk will produce an Ayrshire stone (24 lbs.) of cheese; and 96 pints (48 gallons) of skimmed milk will produce the same quantity: and that 180 pints (90 gallons) will make 24 lbs. of butter.

Another farmer, in a different district of this county, and who keeps a stock of between 30 and 40 very superior cows, and always in con-

and one in Scotland, and which may otherwise be

the improvement which a cross with the Ayrshire
the Welsh cattle; but the Ayrshire cattle are not
and cannot be procured cheap enough, or in ade-
go a fair trial in the south. Some of them have
dairies. As mere milkers, they could not compete
metropolitan dairy cow, the short-horn. They
proportion to their size and their food, but not in
they occupied, and the increased trouble which
ore numerous in order to supply the requisite
produced an unusual quantity of rich cream; but
culty in procuring them, so as to keep up the
l for them was often so great, that they were com-

ies of the Ayrshire cattle we believe to be a little
feed kindly and profitably, and their meat will be
on farms and in districts where others could not
except partly or principally supported by artificial
aps, to a greater degree than any other breed the
properties of yielding a great deal of milk and beef.
ankine well observes, on the inferior soil and the
and the west of Scotland that their superiority as
ole. On their natural food of poor quality they
and long, and often until within a few days of
are moved to richer pasture, their constitution
t their food more into beef. In their own country,
and which seldom proves a good milker, may be
stones, and bullocks of three years old are brought
ones. There is a lurking tendency to fatten about
re will bring to light; so that when the Ayrshire
she loses her superiority as a milker, and begins
n this account it is that the English dealers who
ows generally select the coarsest animals they can
is consequence of the change of climate and food.
e the qualities of any cattle, and it cannot be denied
y to fatten when their milk begins to fail, or which
e Ayrshires must yield to their forefathers the
to their neighbours the Galloways, when put on a
be left considerably behind their short-horn sires
curiant pasture. It will be long, perhaps, before
with the butchers, for the fifth quarter will not

farm
cows
mana
the b
value
'M
so as
the w
up th
meal,
feeds
six at
rain c
begins
of clo
When
ber, th
after, d
nips, a
Part of
winter
during
toes ar
Chaff,
are gen
vey, p.
Mr. I
deficien
into par
they are
the mid
are fed
They a
a suffic
milk is
can wit
continu
the rest
chaff or
potatoes
grass, v
conditio

farmers thirty or forty young cows to keep up the stock and for sale. cows are of the Ayrshire breed in its greatest perfection, and so managed, that every milch cow on his farms yields him her own weight of the best cheese to be met with in Scotland, and for which he draws the value of the cow annually.

‘Mr. Ralston keeps his cows constantly in the byre till the grass has grown so as to afford them a full bite. Many put them out every good day throughout the winter and spring, but they poach the ground with their feet, and pull up the young grass as it begins to spring, which, as they have not any meal, injures the cattle. Whenever the weather becomes dry and hot, he feeds his cows on cut grass in the byre from six o’clock in the morning till six at night, and turns them out to pasture the other twelve hours. When rain comes, the house-feeding is discontinued. Whenever the pasture begins to fail in harvest, the cows receive a supply of the second growth of clover, and afterwards of turnips strewed over the pasture-ground. When the weather becomes stormy in the months of October or November, the cows are kept in the byre during the night, and, in a short time after, during both night and day; they are then fed on oat-straw and turnips, and continue to yield a considerable quantity of milk for some time. Part of the turnip crop is eaten up in the end of harvest and beginning of winter to protract the milk, and part of them are stored up for green food during the winter. After they are exhausted, the *Swedish* turnip and turnip-tops are used along with dry fodder till the grass can support the cows. Chaff, oats, and potatoes are boiled for the cows after calving, and they are generally fed on rye-grass during the latter part of the spring.’ (Vegetable, p. 439.)

Mr. Rankine, in his account of his own farm of poorer ground, which is deficient in winter food, (Farmer’s Series, No. 12, p. 45,) enters into particulars. ‘In the end of autumn, when the nights become cold, they are kept in the house after sunset, and get a little fodder; and from the middle of November until the pasture is again ready for them, they are fed entirely in the house, and let out only in fine weather to get water. They are regularly curried and kept as clean as possible. As there is not a sufficient quantity of green crop to supply them with succulent food, the milk is put off them as quickly after they are taken from the grass as they can with safety. Those that are to calve late in the spring, and thus continue to give a considerable quantity of milk, get a little extra feed, while the rest have straw alone. When the calving time approaches, they get chaff or cut-hay, boiled in a good deal of water, and enriched with potatoes or a little pea-meal, with hay to eat. In this way they go on till the grass, which happens in general about the middle of May, is in as good condition as when they left it. No food is found to produce so

...man she should be exposed to. It is in the winter
e are most deficient, and the cows frequently have
traw and bog-hay, or a very small quantity of turnips
tatoes in the spring; so that, when they are turned
they are very poor, and it is long before they give
of milk, or the milk is good for anything. It is well
any turnips left at winter, for in many cases these are
nn in order to preserve the milk a little longer. If the
the cows of the small farmer fare hardly indeed.
'in 1800 more than a third part of the cows and
want of fodder. Nothing could be done but to kill
t the rest might be saved.'

...Husbandry,' p. 31) gives a satisfactory account of
ry stock. They are selected from parents of the best
brought up that are not of the fashionable colour.
that are dropped about the end of March or the
as they are ready for the early grass, and attain
ter.

lairy stock are not allowed to suck their dams, but are
hand from a dish. They are generally fed on milk
our, five, or six weeks, and are then allowed from
f new milk, twice in the twenty-four hours (Mr.
10 to 12 quarts'). Some never give them any other
cept milk; and lessen the quantity when the calves
other food, which they will generally do at about five
k is totally withdrawn about the seventh or eighth
age. If, however, the calf is reared in the winter, or
efore the grass rises, it must be longer supplied with
t so soon learn to eat hay or straw. Some mix
after the third or fourth week; others add new whey
as been first mixed with meal; and when the calf
l they withdraw the milk, and feed it on whey and
broths, of peas or beans, or of pea or bean straw,
powder, treacle, &c. have all been sometimes used to

aff, and eight or ten sound yellow or Swedish turnips, having the
ken off: add a sufficient quantity of water, and boil them together
as much water as will allow the hand to move easily through the
e turnips, and add three pounds of pea-meal. Give this to a cow
ame in the evening, and as much sweet hay as she will eat up
hen, without much expense, her butter will be as rich, and of as
roduced in winter. Should the peculiar flavour of the turnip be
likely, a small quantity of saltpetre put to the cream will take

allowed what oat-straw they can eat during the night and morning except in time of snow, are turned out to the fields during the day. The greatest part of the young *dairy* stock are kept in byres or stalls during winter, but some are laid out, and supported with straw in the fields.

There is nothing peculiar in the mode of manufacturing the butter, nor even the *sweet milk* or *Dunlop* cheese, so called from the tract in Cunningham in which it was either first or best made. It is difficult to tell when it was first made, for a well-known rhyme says of the olden time, it was customary to look to

‘ Kyle for a man,
And Carrick for a cow,
Cunningham for butter and cheese,
And Galloway for woo’.

Some have traced the secret to an old woman who returned from France after the revolution of 1688: but the whole mystery consists in the richness of the milk; in the cheese being honestly made of the milk and all, although strange stories are sometimes told of the pilfering of the cream, and the extent to which it may be carried without detriment in the milk being, as its name imports, perfectly sweet; in particular attention being paid to the temperature of the milk when the cream is added (75 degrees, and that most accurately ascertained by the milkmaid’s thermometer, the tip of her finger), and in the cheese being kept in a cool place, without any painting or sweating, or rubbing with butter or oil*.

The *Dunlop* sweet-milk cheese has a peculiarly mild and rich taste, and also a frequent want of firmness; thus being readily distinguished from the harder, rougher, dryer *Cheshire*, and the mild and fatty but sticky *Gloucester* cheese.

The *skim-milk*, or *common cheese*, is made in *Ayrshire*, as everywhere else, of the milk from which the cream has been separated†.

In *Carrick* chiefly, but not exclusively, many black cattle are reared and fattened for the *Scotch* and *English* markets. They are a peculiar breed, the history of which cannot be perfectly ascertained.

* Mr. Aiton says, ‘ I had access to know that John Reid, tenant in Silverburn parish of *Kilmarnock*, made full-milk cheese on that farm as early as the year 1740, was made by John Love in *Monkland* in that neighbourhood, about the same time, but it was not until the year 1770, that any considerable number of the farmers in the neighbouring parishes began to make full-milk cheese. (‘ *Dairy Husbandry*.’

† For a very interesting comparison, and one rich in practical information, of the manufacture of the *Cheshire* and *Dunlop* cheese, we refer to Mr. Aiton’s ‘ *Treatise on Dairy Husbandry*,’ and also to the ‘ *British Husbandry*’ of the *Encyclopædia* Series.’

the cattle is carried on by the drovers and country-
men between the Scotch and English dealers).
little capital to begin with, but others, at their
credit of a fair character. Their common practice was
giving their bill for what they purchase, payable at
zier took this bill to a bank, endorsed it as a *cau-*
oney. If the drover met with a ready market in
the bill when it became due—if not, the cautioner

is mode of doing business, there was a great deal
k; and when a great drover happened to fail, a
almost laid waste. This mode of dealing yet
ent, but the farmer, grown wise by experience, is
o deal for ready money.

rs in Carrick carry on an extensive business in
buy up those that are old, or which fail at the
breeders, and lay them on the pasture about
y remain a year, when they are bought up by
supplying the Edinburgh and Glasgow markets.
a better quality than the stots; they are fed in the
whole season; they seldom get turnips or other
winter, but when the pastures begin to fail, hay and
em twice in the day until about the beginning

d mountains of the south and south-east extremities
rable number of black cattle are reared. They
s those which we have just described; but even in
state of husbandry, many more stock are kept on
possibly thrive, and there is a sad deficiency of
food during the winter.

age of Colmonell, on the banks of the Struchian,
ast three thousand black cattle; the breeding of
in this part of the country, and their value has

d to prevail in some parts of Ayrshire, and particularly in the
The husbandry horses were hired during the winter and spring
cts, and after the ploughing and sowing were over, they were
poor state, to do the work of their ill-judging masters. The
ning of a little money, were the alleged excuses.

cal account of the parish of Lanark, gives an interesting account
e inclosure and planting of Lanark-moor, which consisted of
ed to heath and bent grass, in the neighbourhood of a populous

six
sev
dea
exce
cent
L
with
sun
stra
occ
clas
shir
T
stock
They
and
their
not s
M
at W
beaut
was
shou
appr
the
woul
not s
becan
and m
tured
from t
he pla
by son
for the
long b
He
parish
the lab
house
the ou
This is
but he
began
all the

sixty miles through the heart of the county. The climate is mild, severe frosts or snow are seldom of long continuance;—there is a deal of natural pasture and meadow-land, fitting it to become an excellent dairy-country, and which has been its character for many centuries.

Lanark is supposed to contain 30,000 cattle, all of which are connected with the dairy, except a very few that are bought in to feed the summer pastures. The breed, as in the majority of dairy counties, is strangely various, according to the caprice, or skill, or ignorance of the occupier of the ground. They may, however, be divided into two classes—the Highlanders, with all their varieties and crosses, and the shires, which are gradually superseding everything else.

The dairy breed, on the borders of the Clyde, although of the Ayrshire stock, are somewhat altered by the difference and superiority of the soil. They are longer and rounder in the chest, heavier in the fore-quarters, and less capacious behind; they appear to have materially improved their grazing qualities, and yet, contrary to their usual character, they have not suffered much deterioration as milkers.

Mr. Aiton ('Dairy Husbandry,' p. 27) says that 'Lord Belhaven, at Wishaw-house for several years a bull of the dairy breed, of uncommon beauty; he was, however, a native of Beith, in the county of Ayr, was longer and rounder in the chest, deeper in the ribs near the shoulder, and his fore-quarters stronger and heavier than the bull approved of in the county of Ayr.' From him descended a great number of the Lanarkshire cattle. The fact was, that the richer soil of Lanark would maintain a heavier beast than that of Ayrshire: Lanark is not so decidedly and proverbially a dairy county; therefore the dairy breed became deservedly a favourite, on account of his superior weight

and manufacturing town. Mr. Honeyman, advocate of Groemsay, was the first ventured to fen, or take on lease any great quantity of this common land. He obtained from the magistrates of nearly 300 acres. Part of it he inclosed for pasturage, and he planted with Scots pine and larch, and beech and ash; but he was violently opposed by some of the burgesses, who claimed an immemorial right of servitude upon the land for the pasturage of a certain number of cattle, and for fuel, *seal* and *divot*; and it was long before they could be induced to accept a more than equivalent for this right.

He also states, that until after the middle of the last century, 'the lands of the parish were generally let in small farms for nineteen years, the rents paid in victuals, the labour performed by the tenant and his own family. A few acres adjoining the house were kept in constant tillage; upon which all the dung of the farm was laid. The out-fields were kept alternately for three years in oats and three years in peat. This is the wretched system of infield and outfield, to which we have before referred, but he adds, when the victual rents were abolished, a spirit of industry and improvement began to diffuse itself over the parish. A regular system of inclosing commenced, and all the advantages connected with it.

the district of Strathaven, on the borders of Ayrshire. Strathaven veal is supposed to possess a peculiarly high quality, and is much esteemed in the markets of Edinburgh. The calves which are dropped in Ayrshire and Strathaven and the spring are sold to those who are engaged in dairy husbandry in Ayrshire and Strathaven. (‘Survey of Ayrshire,’ p. 442) gives the following management of this department of dairy husbandry:—‘fed on *milk*, which they are taught to drink given to them by some feeders sparingly at first, to make them more keen, and to prevent them from loathing their food. As they grow up, the quantity of milk is gradually increased to such a quantity as they can be made to drink; but others, with better management, can be made to drink a good supply from first to last.’ For the first week or two the calves are able to consume more than one-half of a good cow’s milk, and are then coaxed to eat in order to make fat veal, a calf will consume a cow’s milk, and, before it is two months old, will consume the greater part of the milk of two cows. The calves of the Strathaven stock have usually the first drawn milk, and those of the Strathaven, that which is last drawn from two or three cows; and the first milk, provincially named *forebreads*, and the last milk, and that which is last drawn, the *afterings*, are the best. Mr. Aiton reprobates the practice of mixing eggs and cream with the milk, from the erroneous notion of their darkening the milk. The rights of these animals:—certainly they cannot be kept in a dark stable, but of this crime of darkening the calves is innocent.

Mr. Aiton adds, and it contains the whole mystery of calf disease, that the part now used in feeding calves in the vicinity of Strathaven is to feed them, after the first two or three weeks, *abundantly* with *plenty of dry litter* under them, in a place that is neither too hot nor too cold, and to *exclude the light*, as calves are too sportive when they enjoy much light.

When they become *costive*, a little bacon or mutton-broth will cure them; if they begin to *purge*, a small quantity of *rennet* will cure the disease. A lump of *chalk* is usually given with the milk, and with decided advantage.

According to expedite their fattening is not approved of; and the use of hay, or oil-cake, or linseed, or any other food is not approved of. They are occasionally reared to a most extraordinary size; and I have seen nearly twenty-six stones, exclusive of the offal. An instance of one that weighed more than forty stones. After

the
week
farm
ing c
is on
unmi
—‘B
them
ing c
of th
their
on c
their
above
be w
to the
the b
with
brute
merc

* M
Great
sold i
which
of Sh
nearly
died.
perial
haps,
weeks
when
that p
forcin
† V
Mr. H
is prin
Glasg
amoun
from a
them
replace
each co
This se
ing to
ing is

the milk of more than one cow must be given to it, and then, weeks old, and in proper season, it will be worth 6*l.* or 7*l.* The Strathfarmer, therefore, realises a profit of more than 10*s.* per week from a young calf, and some have gained as much as 12*s.* or 16*s.* per week. This is one practice of too frequent recurrence in Strathaven, which deserves unmingled reprehension. We relate it in the language of Mr. Aiton (—‘Butchers and others who purchase young calves in the country to take them to towns to be slaughtered, do not in Scotland transport them lying on their feet, as is (sometimes) done in England, but they hang them by their feet, as cannot travel, in pairs by the feet over a horse’s back, their backs and heads hanging downwards; three or four pairs of calves on one horse, while the butcher sits upon the top of the group, during their agonizing cries. Others heap as many living calves into a cart, one above each other, all tied by the feet, as a horse can draw. It would be worthy of the magistrates of the district to extend their commiseration to these animals, so cruelly and so unnecessarily tortured, and to exhort the butchers, or others who deal in that species of stock, to treat them with a proper degree of humanity. A merciful man is merciful even to brutes, and those who practise cruelty towards animals will not long be mercifully towards the human race †.’

* Mr. Aiton illustrates this in his ‘Dairy Husbandry,’ p. 90. ‘Thomas Harvie of Great Hill, near Strathaven, fed, about the year 1765, a calf to such a degree, that he sold it at the price of 5*l.* The price of veal was not higher at that time than 2½*d.* which would make the calf more than 34 stones imperial weight.’ ‘In 1815, Mr. James of Shawton, near Strathaven, fed a calf to the weight of 35 stones, and he was offered nearly 16*l.* for it; he refused to sell it at that price, and it soon afterwards sickened and died.’ In 1819, Mr. William Granger of Dykehead fattened one to more than 38 stones imperial weight. Mr. Aiton properly remarks, that ‘feeding to those weights proceeds, perhaps, more from ostentation than prudence. A calf well fed until it is from four to five weeks old, will (in the neighbourhood of Strathaven) if it is ordinarily thriving when the market is not very low, sell at from 4*l.* to 6*l.*; but when a calf is brought to that pitch, the milk may be turned to better account by feeding a young one, and forcing one already sufficiently fed to a size and weight above nature.’

† We extract from the same author (p. 65) an account of the dairy establishment of Mr. Harley, at Willowbank, in the neighbourhood of Glasgow, and from which the city is principally supplied with milk. He previously tells us that ‘the number of cows in Glasgow and its neighbourhood whose milk is sold sweet to the citizens, may probably amount to two thousand; and as these cows are the very best of the dairy-breed, selected from all parts of the country, and are highly fed, both to procure milk and to fatten them fat; and as they are always sold to the butcher whenever they are fatted, and replaced by other cows that are lean and newly calved, it may be reasonable to suppose that each cow will yield, on the average, twelve Scotch pints (six gallons) of milk every day. This seems to be an enormous quantity, and, allowing for occasional deficiency, amounts to about 2000 gallons yearly from each cow. Then, after telling us that ‘the practice is similar to that practised in other towns in Scotland, consisting of gr-

the city better than it had been before, but he erected cold and
the only thing of the kind provided for public use in or near
ople, who took the benefit of these baths, having expressed a
arm milk after bathing, Mr. Harley procured a cow for that
soon became a place of general resort, he not only increased
so as to answer the demand, but perceiving that the city of
with that valuable article of food, and that much of that
of bad quality, he began at first to supply his friends, and
milk entire as it was drawn from the cow, and in a state of
own in that department of agricultural produce. His byre is
cows, but he has for some time past had about twenty more
es to add to the cow-houses.

enlarged at different periods, its external figure is not so com-
have been, but in its internal construction, it is the most
kingdom. The cattle are placed in double rows across the
each other, with a road or passage between them, from which
w having a grip or groove behind, into which they drop their
l between it and that of the next row. Stalls for two cows are
y pillars of cast iron, having grooves, into which the division
fixed. Each cow is bound to an upright stake, with an iron
swivel to a ring round the stake, and which slides up and down
s her head; and when the cows are to be fed with potatoes, a
trevis by a small chain, is put through a hole in the stake,
he ring, prevents the cow from raising her head, and thereby
potatoes. A trough, or crib, is placed before each cow, and, to
ering their fodder, a grating of strong wire, suspended on
window, is placed in front of each pair of cows. It is thrown
n, and put down to prevent the straw, &c., being thrown out

The grating, while it keeps the fodder from being thrown
e cow's breath to escape, and does not confine it within the
ler the food unpalatable, and oblige the cows to breathe in a

iefly from the ceiling, and the windows are constructed so that
r to give vent to the bad air, and by opening the doors or
he byre, more or less, according to the state of the weather,
e is so completely commanded, that it can be rendered at all
nding atmosphere.

ar as possible at sixty-two degrees on Fahrenheit's scale; and to
, a thermometer is placed within the house.

een the heads of every two rows of cows, and one between the
own the centre of the house, from the one end of it to the other,
lain with hewn pavement, and are, with the gratings, division
hed every day, and kept as clean as the lobby of a dwelling-
e cows are curried and brushed daily, and kept as clean as

ps declines a little towards the centre, to lead the water into the
towards the cows, so that the urine may run off when the
e whole urine and washings of the byre, with the juices of the
washing-house, connected with the baths, &c., are collected
d used as manure. The cribs incline towards the centre, where
so that by pouring a small quantity of water at the other end,

Ma
and
you
fine,
com
for
diat
pos
desc
up t
imm

THI
It is
its b

THIS
occup

the gr
pigger
'T
milkin
'T

and ea
aggreg
every t
byres,
carts, c
'A

and so
rated,
water,
so clos
below
duce v
are w
running
inside

'Mr
uses to
potatoe
the boi
the wo

May to that of August. The herbage on the better spots is then cut and the hay stored up for winter food, and the pasture is stocked with young Highland cattle, who live on the grass while the weather continues fine, and to whom some of this bog-hay is given when the storms of winter come on, or the snow is on the ground. If there is no shelter provided for this purpose, a rude kind of shed is erected, to which they immediately betake themselves. These cattle are sold off in May, and are supposed to have increased 25s. or 30s. in value. On some farms of this description, many neat cattle are bred: the females are retained till up the milking stock, or to sell at two years old; the calves are immediately disposed of.

THE SOUTH-EAST LOWLANDS.

THIS district contains the three Lothians, with Roxburgh and Berwick. It is an arable district, and in no part of Scotland has agriculture and its branches been carried to a greater degree of perfection.

LINLITHGOWSHIRE, OR WEST LOTHIAN.

THIS county is beautifully situated on the Firth of Forth; its rich soil is occupied in pasture, or devoted to the raising of grain. The dairy

the grains and refuse of food is washed into the trough, and is from thence carried to the piggery.

‘The milk is clean, and free from every impurity; it is poured immediately from the milking pails through a hair-sieve into the milk vessel in which it is carried to town.

‘The pails into which the cows are milked, and other vessels used, being graduated, and each cow having a running number, the quantity of milk drawn from each is ascertained, and regularly entered in a book by the dairyman. The aggregate of the whole, is ascertained, and regularly entered in a book by the dairyman every time the cows are milked. Part of the milk is sold at the dairy-house in byres, and part of it is carried through the streets of Glasgow, in large cans on carts, each drawn by a pony.

‘A given quantity is put under the charge of the driver, for which he is accountable, and so tenacious is Mr. Harley of supplying the citizens with milk pure and unadulterated, that he puts it out of the power of those who retail it on the streets to introduce water, or any other impurity. When the milk is placed in the cans, they are locked so close that no air is admitted, except as much as will make the milk run at the bottom; and the air hole is so constructed, that it is not in the power of the driver to introduce water, or any other liquid, by it. The milk-pails, and the whole of the apparatus, are well washed and scalded in boiling water every time they are used. The cans running off the milk are so constructed, that they can be opened and cleaned inside at pleasure.

‘Mr. Harley has erected within the byres a very handsome steam-engine, which he uses to raise water to supply the byres, drive a straw-cutter, and a machine for cutting potatoes and turnips, on the principle of that used in cutting logwood. The steam of the boiler is used in steaming potatoes and other food for the cows, in a large vat. The work people term “the cows’ tea-pot.”’

, brown, or a mixture of brown, or a black and
revails. The cow will feed to from 28 to 35 stones
e about six imperial gallons of milk per day, and
unds of butter per week, for the first two months
hich, the milk will gradually decline, until three
ring, when she will become dry.'

d to Mr. Dawson, for the following valuable account
of cattle in Linlithgow. 'The farmer occasionally
of a favourite cow; but in general, the calves, both
ent to the butcher*. The calves that are preserved,
r's milk newly drawn for one month, and consum-
milk. The cow generally calves in May, and the
l grass in June. In the succeeding winter the calf
place, and fed on straw-chaff and the refuse of
s, and turned out to graze in the ensuing spring on
bull-calf is castrated when two or three days old,
reared; and after being grazed and fed in the cart-
, he is disposed of to the butcher, and will weigh
Dutch—he will give from four to six stones of tallow,
h from four to four and a half stones. The Lothian
ompared with the cow of that district. The differ-
y striking. It is a full-sized middle horn, the head
l, but the ribs are deep and the legs are short.

are chiefly of the West Highland breed, purchased
alkirk. They are put into a strawyard that is walled
covered place to afford them shelter; and they are
winter on straw and water, with the refuse of the
is called watering, and it affords a good supply of
In the spring they are turned out to graze, and if
condition, are sold in the autumn to the butcher,
they are finished off with turnips.

n previously well grazed, are likewise bought at these
e better sort of turnips. They are stall-fed from
and are then usually ready for market. They weigh
lbs. Dutch, and an acre of turnips will feed two

s this; he says, 'The farmers now do not even rear their own
them from time to time as required; in some cases every
is always in full milk, the new cows being purchased newly-
mer year put to fatten as soon as they become yell, or dried up
succulent food enabling the husbandman so to do.'

TH
and
the
met
ever
leas
the
vati
N
vote
burg
to h
upon
farme
from
of ho
bourh
else, c
The
was g
its co
on va
freque
stones
order t

* Mr
old Linl
not unc
heavy r
gadman
three m
drawn b
going w
in better
in agricu
† Mr.
nagemen
the horse
took care
sisted in
up in a r
also, in s

THIS county, although not of great extent, has more variety of climate and produce, than any other in Scotland. The northern part of it, the Firth of Forth, is rich and highly cultivated. On the south side metropolis, and to the very feet of the Pentland and Moorland hills even up the sides of them, there is much ground tolerably productive at least in good seasons; but on the tops of the hills, and in a great part of the upland district, there are tracts of land which bid defiance to cultivation.

Not more than one-fifth of the arable land of the county is fairer, devoted to pasture, and the greater part of that is in the hands of the Edinburgh butchers, whose stock is continually changing, and cannot be said to have any specific character, and which is only halted and pressed upon it rather than fed. Much of the pasture in the occupation of the farmer is devoted to the same purpose, and his profit principally derived from the sums he receives from the occasional, or regular turning out of horses and cattle. The permanent stock, and especially in the neighbourhood of Edinburgh, consists of dairy cattle; and that, as every where else, comprising all kinds of breeds.

The original Lothian breed, about 1765, according to Mr. Robertson, was generally of a black colour, or having a great proportion of black in its composition; though intermixed with white in various proportions on various parts, as on the flanks, the belly, the shoulders, or more frequently in a stripe along the back. They were generally from 22 to 25 stones in weight, when they were fed to a marketable condition; and in order to which, in those days, they were not required to be very fat.

* Mr. Gray, in his statistical account of Livingstone, gives a curious description of the old Linlithgow plough. He writes in 1798, 'Not much more than 25 years ago, it was not uncommon to see four horses and four oxen, dragging and staggering before a heavy plough, with a very small furrow, at the rate of about a mile in an hour, while the gadman or driver, the only active being of the cavalcade, was obliged to traverse a circuit of three miles to their one, to prevent them from falling asleep. Now we see no more drawn by more than two horses, carrying with them a furrow of twice the weight, going with apparent ease and three times faster; while the horses are of a better breed, in better order, and maintained at a less expense.' This and several other improvements in agriculture were introduced by Sir William Cunningham.

† Mr. Robertson (Rural Recollections, p. 165) gives an amusing account of the management of these cattle:—'This species of stock was rather better cared for than the horses. They were peculiarly under the gudewife's management, who with her took care that the milch cows should not be neglected in their *sodden meat*, which consisted in a *hotch-potch* of small potatoes, weak corn, with cabbage and greens, all mixed up in a mass among bean-chaff, in a large cauldron for the purpose in an outhouse; also, in separate masses the *kavings* or rakings from the barn-floor, and the shorn

present time, cost from 12s. to 15s., whereas an
st from 9l. to 12l. The Teeswater cow, after standing
ll occasionally fail in her feet, and she will then cease
a total wreck, especially if she is old. The Ayrshire
so heavy on her feet, and although only half fat, may
vantage and with less loss, if she too should begin to
erness in her feet, or any other cause.*

er with the bladings of the greens in their raw state from the
lleged) rips of corn drawn hiddling-wise from the stacks in the
he new-calved cows, or any stray stuff that bore a semblance of
. The herd boy, too, was enjoined to let the cows get, aye, the
grass in preference to the horse, among the balks and waste
so much in those times on almost every farm. This anxiety in
fare of her cows was generally connived at by the gudeman,
any little pilferings of the kind, as he knew it would be all very

at-Stock Dairy Company was established in 1825, for the pur-
habitants of Edinburgh with pure milk. The grounds called
about a mile from Edinburgh on the London road, and also some
eatfield, were purchased at the expense of 8000l. ; and 14,000l.
he erection of a noble building. In the front of the edifice is a
the centre of which is the principal entrance, having a column
a handsome pediment. The interior of this projection contains
with it in form, and through which the visitor passes into the
oble place, and is supported by two rows of cast-metal pillars.
the same material, and are capable of containing 200 cows under
igh, and from the centre of it rises a large dome, for the purpose

It is also lighted, and air admitted at both ends, and on one of
ery over the principal door, the visitor has a pleasing view of

ne, and each is supplied with a pipe ; by means of which it can
ter admitted for the common drink of the animals.

below, through the whole length of the byre. The urine readily
conveyed without difficulty into these vaults, whence they are
l that opens on the main road.

om for the Directors, and one above that for servants. The
, parallel with the byre, contains the manager's house, counting-
ing-house, engine-house to churn the milk, store-houses for
steaming-house to prepare food for the cows, stables for the
and everything that can be wanted in such a place. The ground
ront of the building, is tastefully laid out as a shrubbery ; and
pare the cream.

lations of the kind, it did not answer. There were never more
he byre ; these rapidly diminished in number, until the concern
ne, that it was abandoned by the company, and let to a spirited
y whom it is still conducted, and who has 60 or 80 cows in the

nation, and also on many subjects connected with our work, we
riend, Mr. Dick of Edinburgh.

Mr.

recently calved. Edinburgh is supplied with sweet milk by cowke the neighbourhood, or large dairies; two of which are established outskirts of the town. The butter-milk, or *sour* milk, is brought greater distance.

A few cattle are bred among the hills, and more are grazed, principally winter grazing. These are chiefly of the West Highland breed. There are many tracts of ground sufficiently sheltered, where they may be kept during the winter, and on which sheep cannot safely be turned. Other still wetter portions of the moorlands produce plenty of hay—enough—but which the stock readily eat during the winter months.

Mr. Brown has given us some valuable hints as to the management of the cows. He prefers the fresh draff or grains from a strong ale brewery, to any other feed for the production of milk and of a good quality. He gives them two feeds of (a bushel constituting a feed) twice every day, and also two feeds of grass or clover. When green beans, or peas, or tares, are to be obtained at a moderate price, they are preferred, as imparting a richer quality to the milk than the grass will do. A certain quantity of salt is given at every meal to promote the digestion of the food, and preserve the health of the animal, and produce a degree of thirst that will make them eager to drink, and thus yield more milk. He considers the draff from table beer or draught as a very inferior quality, and producing a less quantity of milk and of a very inferior quality.

The sproutings (*cummins*) of malt furnish a valuable article of drink. He takes two bushels into a large tub, and adds as much boiling water as will fairly draw it as thick as cream, covers it up close for seven or eight hours, and then adds hot or cold water, as required, so that the infusion may be given to the cows comfortably warm, having previously put in a very considerable quantity of salt. The tea from these two bushels will be as much as 70 or 80 cows will drink at one time, and he commonly gives it twice every day, before they are fed with the draff.

At the commencement of the turnip season, and when the turnips are juicy and tender, he gives less of the *cummins* to drink, or has recourse to distillers' draff, in order to prevent the milk from being too much lowered in quality. Potatoes likewise are a very useful drink, when boiled, until they are dissolved through the water. Two bushels of potatoes may be thus mixed with sufficient water to satisfy 70 cows, and will very considerably enrich the milk, when given with salt before the cows drink. Steamed potatoes he seldom uses for the milch cows; they fatten well, but they do not produce so much milk as raw potatoes. Sometimes, when the turnips are fresh and tender, he gives one feed of them, and one of steamed potatoes, with the usual feeds of draff. Steamed potatoes, with which a little bruised or ground grain is mixed, have been found useful in preparing the dried cows for the butcher.

* The Costorphine cream used to be in high repute in Edinburgh and the neighbourhood. The process, as extracted from the statistical account of the parish of Costorphine, is very simple. 'They put the milk when first drawn into a barrel or vessel, which is submitted to a certain degree of heat, generally by immersion in hot water; this accelerates the separation of the oleaginous from the serous parts of the milk. The milk is then drawn off by a hole in the lower part of the vessel, what remains is put into the plunge-churn, and, after being agitated some time, is sent to market as Costorphine cream.'

the cattle are bought at Falkirk, in September and not from any particular breed, but according to the purchaser. They are mostly Aberdeens, Angus, or few Highlanders, which are put into the yard immediately home, and are fed in the beginning of winter on afterwards on Swedes. They are rarely tied up, but the reasons assigned for this are, that the skin and the bone to bear the journey to the market; and that the cattle can rot a greater quantity of straw. Mr. Rennie, indebted for much useful information, tells us, that he had 10 bullocks feeding during the winter, and that he had short horns when he can get them well bred.

Until within a few years, were so various in their form as difficult to trace their ancestry with anything like accuracy. There were among them many very excellent milkers. (Mr. Fantassie, had a cow, that, during one week, yielded 22 gallons daily), from which were produced 22 pounds of butter.

A cross of the Holderness with the native breed, but as a great measure to the Fifeshire and the Ayrshire and an increasing number of tolerably pure short-horns, among them.

At Ormiston there used to be a mixture of the native cattle. They were short-horned and hand-hell, and gave much milk. Five or six gallons of common produce.

Accompanied with a letter from Mr. John Rennie on the subject from which we make the following extract, containing Mr. Rennie's account, and which, in justice to so enterprising a man as Mr. Rennie, should be placed upon record. 'The means among the few who have directed their attention to the improvement of cattle) is short horns, or Teeswaters, which I myself; having selected them from Mr. Robertson, of Glasgow, have no hesitation in saying, had some of the best in the kingdom. I also had two or three bulls of the best quality of Durham. I had three or four large sales of cattle attended by some of the most celebrated breeders in Scotland. Bulls were bought at from 50*l.* to 120*l.* each, to and above 300 miles south.'

Mr. Law-hill, to whom we are indebted for some previous information, that about the year 1818 and 1819, the short-breed of the best and purest sort, was introduced

The spirited exertions of Mr. Rennie have not been followed by others as they should have been, partly from disinclination to move from the old track, but more from the badness of the times.

Some agriculturists, however, began to direct their attention to the crossing of the short-horn bull with some of the Scottish breeds, such as the West Highland and Ayrshire cows, and confining themselves to one cross. In this way they have produced some very fine animals, possessing many of the best qualities of both breeds, and particularly combining the maturity, aptitude to fatten, and beautiful form of the sire, with the beef and hardy constitution of the dam. A few went beyond the first cross, and the best qualities of both breeds were lost.

ROXBURGHSHIRE.

THE cattle of this district are much changed since Dr. Douglas wrote his 'Survey of Roxburghshire' in 1798. He says, that 'if there ever was a breed of black cattle peculiar to this county it cannot now be distinguished. For several years a number of the Northumberland, Lancashire, and Galloway kinds, a few of the Dutch and Guernsey, and many from the northern counties of Scotland, have been brought into Roxburghshire, and their offspring, from various crosses with each other, forms the principal part of its present motley stock.'—P. 144.

Now, except with the small farmer, and it is the same with the Scotch farmer everywhere, there are few counties in which the breed is so distinctly marked. He acknowledges that two kinds were beginning to obtain a preference, 'one of them, the polled or Galloway kind, whose properties are well known over all the island; and the other (to which he does not give a name) with small horns of a middling length, thin necks, round bodies, and short legs.'

This nameless breed, which was indeed the Ayrshire, began to assert its superiority over the other cattle of the south of Scotland. The degrees drove before it the polled breed and all the crosses, and it became the prevailing stock in Roxburghshire. Within the last ten or fifteen years, however, a second revolution has been commencing. The long horns, zealously cultivated on the English portion of the south of Scotland, have been finding their way in increased numbers across the Tweed, and disputing the palm with the Ayrshire, and threatening to beat them out of the field. The last cattle-show at Kelso (1832) was a complete victory, for while thirty short-horned bulls competed for the prize, only two Ayrshire heifers were produced.

The rich soil of a considerable part of Roxburghshire, and

number of cows, so that in this district there is little more butter than is sufficient for the consumption of

and south of the county there is much fine pasture. Many cattle, bought at the northern trysts, or are grazed during the summer, or stall-fed in the

the turnip-fed cattle at 6000, and those that are number.

employed in husbandry.

BERWICKSHIRE.

been called the cradle of Scottish agriculture. Important improvements in husbandry generally, breeding and management of cattle, commenced; much of improvement has been rapid elsewhere, some not inferior to the most highly cultivated districts of

1772, one of the parishes was described as positions of bad husbandry to which we have so often of the cattle husbandry of Scotland. 'The country inclosed, and let out into small farms; an incon- each could be kept in condition for tillage. The little manure, the out-field was partly cropped with of manure, and partly allowed to lie waste, pastured cattle. When that which was cropped was allowed to rest, and a portion of the other waste in its place; and the whole face of the country exhibited indigence*.' This was a faithful picture of Berwickshire before the introduction of turnip-husbandry, and a more the rearing and feeding of cattle, a great part of it from a bleak and neglected district into a beautiful country.

labourers in the work of improvement may be of Coldstream, who, in 1755, began to cultivate at the year 1770 Mr. Robert Hogarth, of Corpse,

brought, which continued during the whole summer of 1766, mauls, in this county, were slaughtered at Martinmas, and many of those that remained died at the stall in the following and all the straw that remained.

kindly feeders, especially when moved to richer pasture than the
their birth produced, or than was allotted to them there. In
turnip-soiled part of the country, a somewhat larger breed
maintained; and the natives were crossed by the Teeswaters, and
bred and improved stock was the result. This differs little
Roxburgh cattle already described; but some of the richer pastures,
especially the vale of Merse, could support yet heavier cattle,
pure improved short-horn was established there. Mr. Robertson
Recollections, p. 369) thus describes the progress which Mr.
had made: 'He had the finest *hirsels* of beautiful cattle, of his own
ing, that I have seen in any one breeder's possession. On one occasion
counted 136, full grown, pasturing in one field on the Carfrae farm,
elegant form, and fine brindled brown and white colour.'

Among the better kind of farmers, and where the ground was
them, the Teeswater is the favourite breed; but by them it is often
capriciously, sometimes injuriously, and at other times advantageously
crossed. The smaller farmers have more of the half-bred,
strangely mingled; for many of the calves are bought of their
or at some fair, almost without reference to the breed, and reserved
the dairy.

Grazing is carried to a considerable extent in the low country,
there is plenty of hay and turnips. Some short-horns are raised to
great size; and a great many Highlanders are bought for winter-
or to consume the straw and inferior turnips in winter, and be
for sale by grass in the spring and summer.

Mr. Kerr, in his excellent Survey of this County, published in 1794,
says, that 'there are few regular grazing farms in Berwickshire,
pastures are variously stocked with mixed feeding beasts, or
cattle, or sheep of various ages, or young horses, or all mixed together.
These are occasionally going off to market, or taken home to the
cular farms, as the home pastures become thinned of stock, or when
latter-math of the hay-fields are ready for pasturing; and their place
supplied by draughts from the farms, by weaned lambs or calves or
chase from different markets for feeding, or for carrying on to
winter upon turnips; or these fields are occupied by the still more
laneous and continually changing stock of butchers or jobbers, send
receiving fields for their constant purchases, until the demand again
enables them to kill or sell to advantage.'—p. 326.

'No regular dairy grounds are to be found in Berwickshire.
little dairy there is, is entirely confined to such quantity of milk
be spared from rearing the regular yearly supply of young stock

Our cake is not much used, except for carrying on size. Soiling cattle is getting more into practice.

SOUTH-WESTERN LOWLANDS.

Dumfries, Kirkcudbright, and Wigtown.

SELKIRK.

this little and thinly-populated county is devoted consequently, neither the rearing nor the fattening much attention to the Selkirk farmer; but, as on moors there is a considerable quantity of coarse grass which will not touch, the agriculturist is compelled to feed his cattle, either to eat it down in the field, or to cut it to hay. Dr. Douglas, in his 'Survey of Selkirk' says that about 2200 black cattle were kept in the whole county, and 118,000 of sheep were 118,000; but since the draining of the bog-land, the succulent grass has increased so much that cattle with the sheep is indispensable on every pasture. Mr. Hogg calculates that there are about 2200 black cattle, besides a great number of the Highland cattle on the sheep grounds.

Selkirk is said to have been first occupied as a town in 1503; but the old prejudices in favour of the other districts for more than two centuries have prevailed. Mr. Shepherd (in his short but interesting account

of 'Dairy Husbandry,' p. 5, has some valuable remarks on agriculture. 'In a large store farm in the Lammermuir, of the southern or eastern districts of Scotland, fifty, one hundred, acres of land, much of it lying in a state of commons, heath, and rushes, or burns, or streams of water at the best of it, might, by proper industry, be converted and rendered productive of much grain, roots, and hay, for the sheep walks. Part of it could be appropriated every year to the young or weak of the sheep flock; and, when the hill-pasture was exhausted, the sheep would often find relief on the low and cultivated land, where hay, turnips, &c. raised thereon, and stored up for their winter use. The store-masters argue, that the rich grass on such land is not fit for sheep-stock; yet, when deep snow lies long, they drive their cattle on to it, as if it were a similar pasture. The range of sheep-pasture would, no doubt, be taken off the lowest lands for dairy ground, but is nothing more than a range for 20 milch cows, and a considerable portion of good

pastoral rivers, the Ettrick and the Tarrow, with all their tributary
and the land around them) were all of one breed, a sort of cross ma
or red and white breed, and rather a hardy and useful breed; b
the short-horns, or the Ayrshires, or a cross between the two, have
totally superseded them. The short-horns are becoming more an
the favourites, yet for domestic purposes it may be doubtful wheth
excel either the old breed or the Ayrshire cross.

‘The premiums for cattle, given by the pastoral society of Selkirk
are all for the short-horned breed, and therefore the principal
cherish that breed; but the cattle of the smaller farmers and the co
are nearly all of the Ayrshire, or of the cross of which I have s
and which is really the best for domestic purposes, producing mor
and butter, proportioned to the weight of the carcass, than any
breed or cross in Scotland.’

Mr. Hogg deserves much praise for his zeal in improving the
breed of cattle. The late Mr. Milne brought a fine short-horn
calf from Northumberland, which proved so fine a beast, that h
anxious to retain his produce as much as he could to himself. Mr.
however, obtained a calf of his getting, which proved as fine an an
his sire, the use of which he permitted to all his neighbours, and by
of which he effected a change in the breed of the whole district. H
describes them: ‘They are of the short-horned breed, with horns w
the top, and the prevailing colour white; but the breed is rather
weighing when fat 60 or 70 stones. The quantity of milk they give
large, but rich in butter.’

Speaking of the management of cattle in Selkirk, he says, that ‘
is generally, over Selkirkshire, a boundary between the sheep and
pastures, over which the cows are not allowed to range. It is alw
article in the Duke of Buccleugh’s leases, that no cattle shall be a
to graze on the sheep pasture: nevertheless, many farmers, both
and of all the other proprietors, graze young cattle, and Highland ca
their mountain pastures, wherever the farms are rough, coars
spritty, for the cattle eat all the coarser grasses which the sheep ha
The fact is, that on many of our forest and Eskdale farms, the
cattle they keep from May to September, the more sheep they can
as the former eat all the large, rich and succulent grasses, which,
they were mown, would lodge and perish. These Highland and
cattle sometimes graze in the fields the greater part of the winter,
into the sheds and are foddered at night, and when fodder is pl
and manure is wanted, they are fed in the sheds during the whole
winter.’

complete our description of the Scottish cattle, com-

CHAPTER IV.

THE POLLED CATTLE.

It is not that there appear to be the remnants of two distinct kinds of cattle in the parks of Chillingham in Northumberland and in Lanarkshire; the first are middle horns, and

The continuation of the first we have evidently in the Hereford, the Sussex, and the Highland cattle; the second in the Galloways, the Angus humbles, and the Norfolks. How far this may be correct will appear on a survey of these districts.

GALLOWAY.

Wigtownshire and the shire of Wigton, with a part of the county of Dumfries, formed the ancient province or kingdom of Galloway. These counties possess much interest with us as the native country of the polled, or doddered, or **humble* cattle, highly valued in the Scottish counties, and in almost every part of the English properties. So late as the middle of the last century the Galloway cattle were horned—they were not all of them were polled—they were either remnants of the original horned cattle, or the characteristic of the aboriginal cattle would have been preserved although many a generation had passed.

In former years the surplus cattle of Galloway had been sent principally to the counties of Norfolk and Suffolk.†

Curious derivation of the term humble. He says of their black cattle (see *Antiquities of the Western Isles*, p. 186) 'Some are without horns, called by the name of a bee a *humble* bee that wants a sting.'

When Symson was appointed minister of the parish of Kirkinner, in 1682 he published a work, entitled 'A large Description of the County of Galloway, as it was accidentally found in the Library of the Faculty of Advocates, as published by a gentleman connected with Galloway. It is

advanced in life to engage personally in the business, and he delegated the whole management of his property to one of his sons, Lord Daer.

This young nobleman entered enthusiastically into the views of his father, and although he encountered much opposition, and many difficulties, from the ignorance and prejudice of the tenantry, he was enabled to possess the satisfaction of witnessing the accomplishment of several of his projects, when he was carried off by consumption at the age of 30. His plans, however, were adopted and zealously pursued by his son, who succeeded to the earldom, and Galloway owes much of its prosperity to these liberal and patriotic noblemen.

In addition to the Selkirk family, we may reckon among the most famous and successful improvers of the breed of Galloway cattle, the Marquis of Montrose.

now out of print. The following extracts from it will be interesting, as exhibiting the state of the breed and management of cattle in Galloway at that period. 'The north parts of the countrey are hilly and mountainous; the southern parts more level and containing more arable land. The soil is thin and gravelly, but towards the sea it is deeper. The snow usually uses to melt shortly after it falls, unless it be accompanied by violent frosts. The principal products are bestiall, small horses, sheep, wool, white wollen, bier (barley), oats and as for wheat, there is very little. The bestiall are vented in England, the sheep at Edinburgh, the wool at Ayr and Glasgow and Stirling, and the horses and woollen goods at the faires.

'In this parish of Kirkinner, Sir David Dunbar of Baldone (a) hath a park, a mile and an halfe in length, and a mile and an halfe in breadth, the greatest part of which is rich and deep valley ground, and yeelds excellent grass. This park can keep in winter about a thousand bestiall, part whereof he buys from the countrey and in summer about a thousand bestiall, part whereof he buys from the countrey and grazeth there all winter; other part whereof is of his owne breed, for he hath about a hundred milch kine, which for the most have calves yearly. He buys also in the winter time from the countrey many bestial, oxen for the most part, which he keeps till the month of September; so that yearly he either sells at home to drovers, or sends to St. Satch, and other faires in England, about eighteen or twentie scores of the four year olds. Those of his owne breed are very large, and may bring five or six pounds sterling. Those of his own breed are very large, yea, so large, that in August, 1682, nine and ten of that sort were seized upon in England for Irish (b) cattell, and because the persons to whom they were entrusted had not witnesses there ready at the time to swear that they had been seen calved in Scotland, (although he offered to depone that he lived within a mile of the park where they were calved and reared,) they were, by the sentence of Sir J. L. some others, knocked on the head and killed: a very hard measure, and an act unbecomming persons of that quality and station.

'I can say that the park of Baldone is the chiefe, yea, I may say, the first, and best, that ever were, the mother of all the rest, Sir David Dunbar being the first man that brought the park to be in request in this countrey; but now many others, finding the great benefit that might be derived from it, have followed his example, as the Earl of Galloway, Sir William Maxwell, Sir M'Culloch, Sir James Dalrymple, and many others, who have now their parks and closed grounds.'

(a) The ancestor of the Earl of Selkirk's family.

(b) At this period the importation of black cattle from Ireland was prohibited.



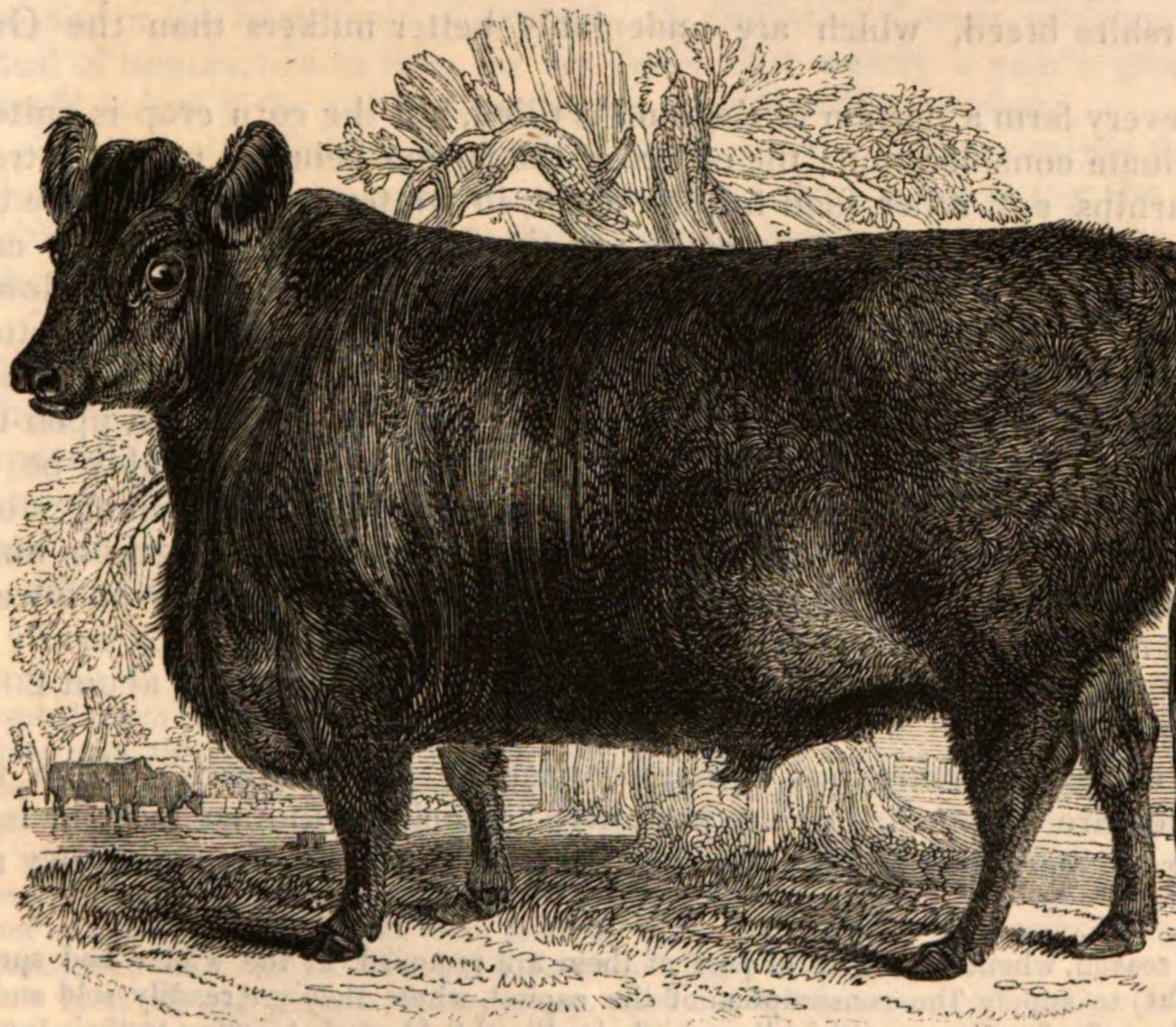
[*Lean Galloway Ox.*]

Portrait of a lean Galloway ox which gained the High-
1821. It was bred by Mr. Mure of Grange, near
sh that we were permitted to acknowledge all our
gentleman,) and belonged to James Bell, Esq., of

are straight and broad in the back, and nearly level
mp. They are round in the ribs, and also between
ribs, and the ribs and the loins. They are broad
large projecting hook bones. In roundness of bar-
they will compare with any breed, and also in the
loins bear to the hook bones, or protuberances of the
smith, the author of the survey of Galloway, says
n above, the whole body appears beautifully rounded
ection of a roller.' They are long in the quarters
the chest, but not broad in the twist. The slightest
at there is less space between the hook or hip bones
most other breeds, a consideration of much import-
e of length of carcase consists in the animal being
little space as possible lost in the flank.

ham breed, but it handles soft and kindly. Even on the moorland where the cattle, during the greater part of the year, are fed on the sward, it is remarkable how little their hides indicate the privation they endure.

The prevailing and the fashionable colour is black,—a few are dark brindled brown, and still fewer are speckled with white spots; some of them are of a dun or drab colour, perhaps acquired from crossing with the Suffolk breed of cattle. Dark colours are uniformly preferred from the belief that they indicate hardness of constitution.*



[The Galloway Ox in good condition.]

* Mr. Culley, who is great authority in these cases, thus describes the Galloway in most respects, except wanting horns, these cattle resemble the long-horns both in colour and shape, only they are shorter in their form, which probably makes them weigh less. Their hides seem to be a medium between the long and the short horns; not so thick as the former, nor so thin as the latter; and, like the best feeding kind of long-horns, they have their fat upon the most valuable parts, and their beef is well marbled or mixed with fat. They are mostly bred upon the moors or hilly country in Galloway, until rising four years old, when they are taken to the fairs in Norfolk and Suffolk previous to the

, and producing shelter for the cattle in the winter in the spring. In the low districts there is little frost; climate is mild and rather moist; and thus a languid season is experienced during the winter, and the pastures constantly

farm is derived chiefly from rearing and feeding the cattle, except in the mountainous districts, where sheep are also grazed. There are very few exclusively tillage lands, and the cows are the principal stock and kept for making butter. In districts in which cows are introduced, they are of the Galloway breed, which are undeniably better milkers than the Gal-

loway. A portion of the land is tilled, but the corn crop is quite a small one; the object of the farmer being to produce straw for winter food for the cattle, and to improve the young cattle. The young cattle are chiefly bred and reared to a certain age in the mountainous districts, or upon the inferior lands in the lower parts of the county, and are kept in the richer soils to produce milk, butter, and cheese, but it is found more profitable to breed and rear them on the inferior lands, and afterwards to feed them upon the rich old pastures. There would probably be no other way in which the Galloway farmers would afford their young stock during the driving blasts of winter. No inconsiderable number of farms are as low as 50*l.* per annum, and even lower; some are from 300*l.* to 500*l.*, while a few may reach nearly or quite 1000*l.* The average rent may be fairly computed at about 200*l.*

reared in a manner peculiar to Galloway. From the birth of the calf, they are permitted to suck the mother more or less, and to have milk*. During the first four or five months they are

the greater part of them are removed in the winter and spring to the consumption of the capital, where they are readily sold and at a high price. The cattle sell so high in Smithfield market, owing to their laying out little or no money on their parts; and it is no unusual thing to see one of these little bullocks of the Galloway breed, although the latter is heavier by several stones. p. 59.

In his excellent treatise on cattle, that 'the pure Galloway breed is of original purity except in the moors of Monigaff and Glenlove, where they are thinner in the hinder quarters than such as have been crossed with other breeds. A curious account of this—'The calves, from the time they are

imagined that the act of sucking produces a plentiful supply of milk which materially contributes to the digestion of the milk and the health of the calf. The Galloway farmer maintains that an evident difference can be perceived between the calf that sucks its dam, and another that is reared from the pail—the coat of the former is sleek and glossy, indicating good health, while the hide of the other is dry and hard, nor is the unthrifty appetite removed until some time after the animal has been weaned and fed on grass. It is also said that a greater proportion of calves fed from the pail die of stomach complaints, than of those that suck the cow.

It is desirable that the calves should be dropped in the latter part of winter or the beginning of spring. A Galloway farmer attaches great deal of importance to this, for he finds that nearly a year's growth and profit is lost if the calf is born in the middle of the summer.

The regular Galloway breeders rarely sell any of their calves for anything but what is obtained only from those who keep cows for supplying the market with milk, and from the few dairy farms where cows are kept for making cheese.

The best *queys* are retained as breeders, in order to supply the market with those whose progeny is not valuable, or who are turned off on account of their age. The other female calves are spayed during the first year. Spayed heifers are usually smaller than the bullocks, but they arrive at maturity; they fatten readily; their meat is considered more tender, and, in proportion to their size, they sell at higher prices than the bullocks.

Mr. Culley says, 'In Galloway they spay more heifers than per-

dropped, until able to support themselves, are allowed to run with their dams, but are prevented from sucking by means of a small piece of leather, with sharp spikes fixed upon the outside, tied upon the upper part of the calf's nose, which, by the pressure of the cow every time the calf attempts to suck, prevents her from letting it, and when the milk-maid comes, when she takes off the muzzle from the little animal's nose, while she strips two of the teats, the calf takes care to empty the other two. As the maid has done, she fixes on the instrument again, but it is done in such a manner as not to hinder the calf from feeding upon the grass.' This might have been the practice in Mr. Culley's time, but little or nothing of it is seen now.

* It is an old proverb in Galloway, that a good farmer would rather kill a calf than a calf. 'The people of this country do very seldom, or rather not at all, sell their calves, as they do in other places, so that it is a rare thing to see veal at some times, and at some few gentlemen's tables. They give two reasons for this, is, because, they say, a cow will not give down her milk without her calf, and so if they sell or kill the calf, they should want the use of the cow; but this, I think might be helped, would they but train up the cow otherwise at her first calving. Another reason is of more weight, viz., since a great part of their wealth consists in the product of their cattle, they think it very ill husbandry to sell that for a shilling, when, at a proper time, would yeeld pounds.'—Symson's 'Large Account of Galloway,' 1682.

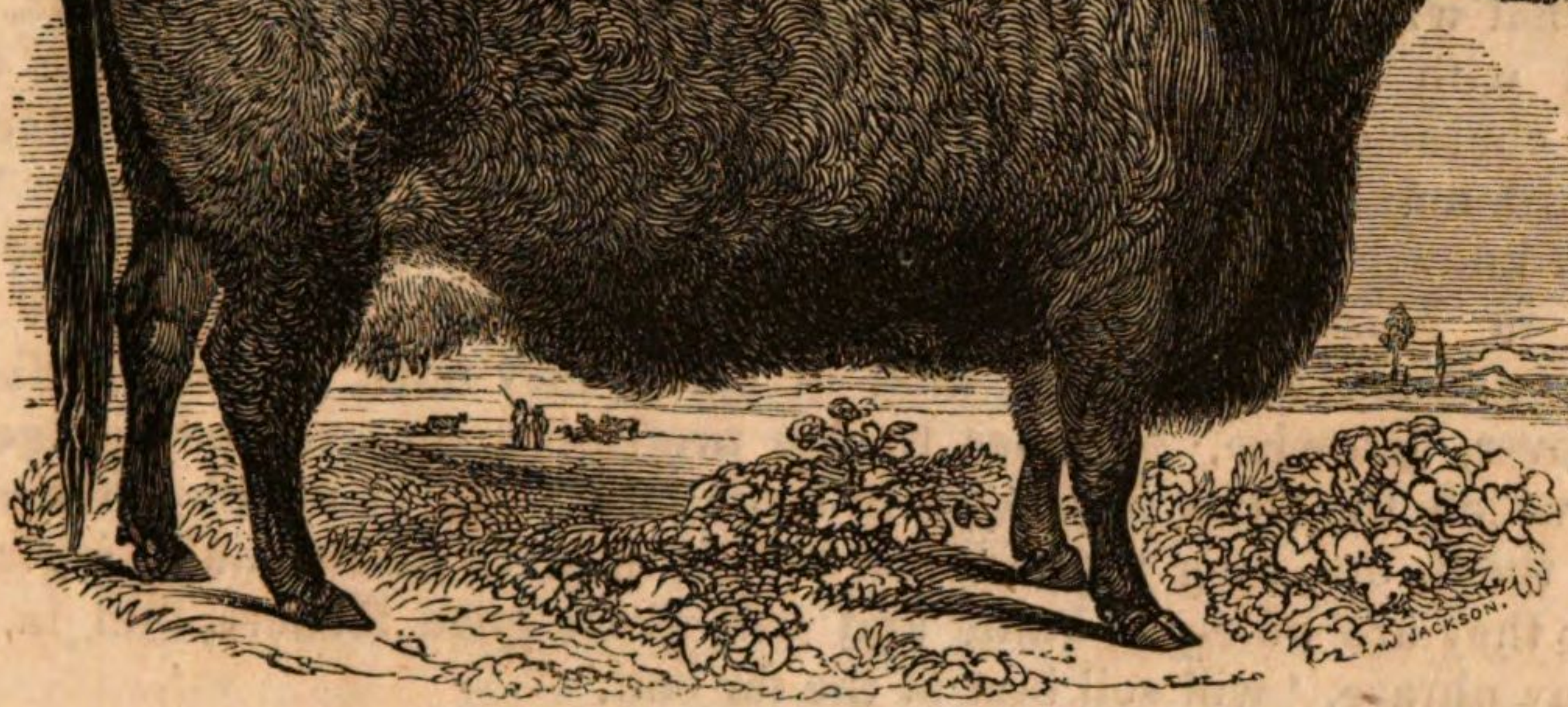
therefore, although the beasts are not in high con-
they had materially increased in size, and are in a
ferred to the rich pastures of the lower district.
land, in Kirkcudbright, introduced the green crop
ay about the year 1770. He began about that time
potatoes, turnips, and cabbages, and is considered the
n the south-west of Scotland; many years, however,
rality of the farmers followed his example. The cul-
to become general about 1780, but the other green
en universally cultivated. Turnips are produced
farms; turnips and rape in a less proportion to the
, more generally, there are yet too many farms on
is grown.



[Galloway Heifer.]

trait of a beautiful heifer, deservedly called the 'Queen'
y Mr. Mure, and grazed by Mr. Wright of Rougham,
owing were her proportions: height of shoulder, 5 ft.
ose to rump, 10 ft. 4 in.; width across the hip, 2 ft.

to
of
of
is
tha
Ga
da
ne
for
I
oth
nur
per
you
a f
inf
ski
yea
exe
I
cow
it is
have
with



[Galloway Cow.]

This cut contains the portrait of a beautiful Galloway cow, belonging to Mr. Gurney, near Norwich.

The Galloway cows are not good milkers; but although the quantity of the milk is not great, it is rich in quality, and yields a large proportion of butter. A cow that gives from twelve to sixteen quarts of milk per day is considered a very superior milker, and that quantity produces more than a pound and a half of butter. The average milk, however, of a Galloway cow cannot be reckoned at more than six or eight quarts per day, during the five summer months after feeding her calf. During the next four months she does not give more than half of that quantity, and for two or three months she is dry.

It has been said that the young Galloway cattle are more exposed than others to *Redwater*, particularly on grass lands that have not been manured with lime. This disease, however, is easily checked at an early period by a few doses of Epsom salts, and removing the animal to young grass, where the field has been recently limed. *Quarter Evil* is a frequent and fatal disease among these young cattle. From its inflammatory character, it must be attacked in its earliest stage, or no skill will be of no avail. When, however, the Galloways become three years old, they will yield in hardihood to none, and are comparatively exempt from every complaint.

It has been remarked in this, as in some other breeding districts, that cows and queys of good quality are to be met with everywhere, but it is difficult to find a Galloway bull free from defect. Too many breeders have become careless from this circumstance. They have been content with a bull of moderate pretensions, and the form and value of their

most districts there may be some good beasts, but of a different and very inferior kind, there is a and that of excellence, here; one bullock selected at erally be considered a fair sample of the lot. The long experience, what kind of cattle will please the, and by whom they are chiefly prepared for the d to that kind of cattle they most carefully adhere. e, becomes by his profession an excellent judge of en purchases in large lots. He is unable to handle ong practice has taught him to determine at a glance equal value and will prove good feeders, and in the will sell best at the far end.'

or the southern markets take place in September and se at St. Faith's on October the 17th, and Hampton th. The cattle are sent off in droves of from 200 to ge of a person called the *topsmen*, who generally goes ass is secured at proper stations and to make all ne- s, and who has under him other drovers, in the pro- out 30 cattle. The journey to Norfolk occupies about expense in summer and autumn is from 1*l.* to 1*l.* 4*s.* ter, when they are fed with hay, they cost 10*s.* or 15*s.*

urchased and paid for by the drovers, sometimes in ally a part of the price is paid in bills, and sometimes some instances, where the farmer has confidence in nts that the purchase money shall be remitted from e money shall be paid when the jobber returns to siness is hazardous, and now and then unfortunate; lers himself well paid, if, every expense of the journey e clears from 2*s.* 6*d.* to 5*s.* per head; and when he credit sufficient to take a drove of 600 or 1000 head et, that is a good remunerating price. From 20,000 disposed of in this way every year, of which about ks and one-third heifers†.

t is reckoned somewhat differently from that of horses; they are they are three, and three years old until they are four. ers, who breed for sale, however, are continually on the watch for of disposing of a portion of their stock; and there are others in country who consider it more profitable to buy young cattle than g stock. They, too, are continually buying and selling; and

t
g
o
a
b
V
fa
s
e
n
g
w
d
p
a
to
ha
an
tha
do
rate
regu
are
sapp
Thi
farm
O
vivi
'A
the c
other
(to w
of 30
with
'I
in th
of hi
to be
com
set ou
'T
wand
impro
profita
pation
ing th
much
inactiv
are, g

mer. We do not believe, as he seems to think, that it belongs to the greater part of them, but some features of it are yet to be traced in some of the cattle breeders and graziers. We give it in his own words in his Survey of Galloway. 'Frequent trading of cattle are necessary, and he seems to acquire the habit of buying and selling any other object than the prospect of a good bargain. Some of them, therefore, keep a bullock more than a year, or when markets are brisk, not more than a few months. With very good judges this has succeeded to a great degree. Some of the most successful farmers have been indebted for their success to their skill in cattle and their address in striking a bargain; and this success has tempted others to embark in the trade, without either the talents or resources for carrying it on. The truth is, it possesses all the attractions of the gaming table. The fluctuation and uncertainty of markets, the gains and losses that follow, the idea of skill and dexterity requisite, the risk connected with the business, these excite the strong passions of the mind, and attach the dealer, like the gambler, to his profession, although he may be assured that he is free from pursuing the road to ruin. He counts his gains, but seldom calculates his losses. After a long succession of bad luck, he hopes that a few successful adventures will enable him to retrieve the desperate situation of his affairs, and the failure and ruin of those who have been gambling in a large way are productive of great detriment to the agriculture and the community generally. The inevitable consequence of this mode of proceeding is that the farmer is a constant attendant on fairs and markets whether he has anything to do or not. One or two days in the week are useless, or worse than useless. The regular attention to minutiae on which so much of the farming business depends, or the regularity in his habits, are forsaken and forgotten; serious expenses, exceeding his gains, are incurred; habits of dissipation are contracted; every moral principle is grasped and destroyed, and he becomes at last disqualified for any business or employment. This is a dark picture. It is not so true and faithful a one as it formerly was, but the farmer may learn wisdom.

Of the lower kind of dealers, Mr. Ross, in one of his statistical accounts, gives a very vivid description.

'A mountaineer will travel from fair to fair for 30 miles round with no other food than the oaten cake which he carries with him, and what requires neither fire, table, knife, or other instrument to use. He will lay out the whole, or perhaps treble of all he is worth (to which the facility of the country banks is a great encouragement) in the purchase of 30 or 100 head of cattle, with which, when collected, he sets out for England, a journey of 300 miles with the roads, manners and inhabitants of which he is totally unacquainted.

'In this journey, he scarcely ever goes into a house, sleeps but little, and then goes out in the open air, and lives chiefly upon his favourite oaten bread. If he fail of disposing of his cattle at the fair of Carlisle, the usual place of sale, he is probably ruined, and is obliged to begin the world, as he terms it, over again. If he succeeds, he returns home to commence a new wandering and a new labour, and is ready in about a month period to set out again for England.

'There are others who job about from fair to fair without leaving the country, and the wandering and unsettled habits which this species of life induces are very unfavourable to improvement; whenever by any accident the cattle trade is suspended, or becomes unprofitable, the persons accustomed to be employed in it, being unfit for any sober occupation, remain in a great measure idle. Even agriculture is burdensome to them as it is wanting in the variety and interest which their usual occupation affords: thus the fruit of much labour and enterprise are often wasted during the long intervals of indolence and inactivity.' The drovers, however, of the present day, deserve a far better character than they are, generally speaking, a very respectable and deserving class of men.



[*Galloway Bull.*]

we are indebted to Mr. Gurney. Cattle are generally very docile. This is a most valuable in every respect. It is rare to find even a bull furious

Smith, in his Survey of Galloway, has some very good management of the breeders here, and a little applicable at day. 'The graziers in Galloway are generally censuring, although they are less so now than at former times, than graziers of some other districts. Their greatest fault is in the spring management, and this is more the effect of the season, for the bulk of farms cannot keep the same number of cattle in summer, and on a reduction of prices, which often occurs in autumn, they must either sell to great disadvantage in the spring market. Hence in ordinary pastures the cattle are still remains with but a scanty allowance of fodder, and are driven by hunger to devour every remnant of grass, and are thus exposed, and thus not a little retard the subsequent growth. But this is not all; for, from the deficiency of fodder, the cattle are driven to snatch up every pile of new grass as it rises, and the ground is kept completely eaten down, and denuded in this first season's vegetation, never afterwards acquires a full growth, nor can the stock in summer which it might have fattened under

Every experienced grazier knows the great advantage of the cattle in spring, until they have acquired their full cover

In fifty years a very great improvement has taken place in the management, and in the rearing and grazing of cattle. Some of the great landholders farm a portion of their own land, and graze cattle, and some of them very extensively. Societies have been established in the counties of Kirkcudbright and all the land proprietors, and the greater part of the farmers have become members of them. These societies have been

pose, on account of the shortness of the passage from Ireland. The merce was once prohibited, from the absurd notion, that it would be mental to the interests of the English breeders; at length it was permitted for seven years by way of experiment, in the fifth year of George and made perpetual in the sixteenth year of the reign of the same monarch. There is a great deal of speculation attending this traffic in It is influenced materially by the quality of grass, and hay, and in England, or by the probability of large crops of these articles, and sums are often speedily gained or lost in the speculation *.

DUMFRIES.

THIS is a considerable wedge-shaped county, interposed between Peebles, Selkirk, and Roxburgh on the east, and Kirkcudbright on the west, and divided from Cumberland by the river Liddel. The natives of Dumfries were, according to Dr. Singer, in his survey of that county, horned, long in the leg, narrow in the back, thin and short in the and neither weighty for their height nor hardy. These, however, have been superseded by the Galloways for grazing, and by the Ayrshires, in their turn have partly yielded to the short-horns, for milking. There is beside a fluctuating and uncertain number of flying stock consisting of Highlanders, principally from Falkirk tryst, and even a few Irish are grazed a part of the year, or wintered in the county.

The richer pasture of Dumfries has given to the Galloways, bred and grazed there, a somewhat larger form and earlier maturity, than they possess in their native district, and on this account they used to be

* Dr. John Scott, in his account of the parish of Swyneholm in Kirkcudbright, describes the polled Galloways as then highly valued by the Norfolk farmers. A yearling would, at one year old, bring from 2*l.* to 5*l.*; at two years old, they would bring 4*l.* to 9*l.*; and at three years, from 6*l.* to 10*l.* At that time, the best of the two years old were usually sent with the three years old to the English market. Speaking of the attempt at improvement, he says, 'our farmers cannot be too careful to preserve this breed, and all attempts to meliorate it by crossing with other bulls have hitherto failed. A gentleman in this country, who had a large dairy remarkable for rearing the best cattle, and who had and fed them until a proper age, when he sent them with other cattle which he sent from his tenants to the English markets, in order to try the experiment, purchased Mr. Bakewell's bulls. He put one half of his cows to this breed, and the other half to a Moorland bull bred upon his own estate. He fed the product equally until they were sent to market at Norfolk, when those bred from the Galloway bull brought considerably more money than the others, besides being easier to feed.'

'On the other hand, the Rev. Mr. Wilson, in his account of Kirkbean, says that Mr. Craik of Arbigland introduced the Bakewell breed upon his estate, and that the same number of cattle upon the same field fattened equally with those of the Galloway breed.'

added to the grazier a profit of 3*l.* 3*s.* per head. Others in the summer, after having fed them on fog-hay in the winter, and usually given from 1*l.* to 2*l.* per head*.

And finely flavoured butter is made on the borders of the county. It is made from the cream only, and no part of the milk.

The milk is suffered to stand about 36 hours, when it is skimmed, and the different meals thrown together, until there is conveniently churned at one time, or the cream has become of its own accord, and the sooner it is churned after it is made, the better will be the butter.

He purchased a farm at Dunscore in Dumfries, and, not content with the native breed, he introduced some of the west-country cows, which would produce more milk. The climate did not agree with him, and the speculation was decidedly unsuccessful.

ANGUS POLLED CATTLE

There have been some polled cattle in Angus; the country-people call them *dodded* cattle. Their origin is so remote, that no account can be obtained into this country can be obtained from the oldest farmers. The attention of some enterprising agriculturists appears to have been directed to them about sixty years ago, and particularly to those on the borders of Kincardineshire. Some of the qualities which seem to have attracted the attention of these breeders are the quietness and docility of the doddies, the easiness with which they are managed, the few losses that were incurred from disease, whether in their stalls, and the power of disposing of a large number of them in the same space.

It was upon them developed another valuable quality—suited for stall-feeding, and the rapidity with which they brought them into much repute during the revolutionary war in their own country, where great numbers were fattened for the Edinburgh markets, but also in England, whither they were sent in great droves for the supply of Smithfield, and also of the

'Gentleman's Magazine,' says that 'he was at the bridge end of a farm where Anthony M'Kie, of Nellverton, sold five score of five years old cattle in good condition, to an Englishman, for 2*l.* 12*s.* 6*d.* each; and old Robert, tenant of a great part of Preston estate, said that he reckoned he could let his farms at 2*s.* 6*d.* per head, *i. e.* his rent corresponded to that

Climate and management have caused another difference between Angus doddies and the Galloways. The Galloways have to endure a moist climate; they are in most cases wintered out in the fields, and at least receive only a scanty allowance of natural hay during the winter part of the season, and are chiefly sent to the Norfolk market in that state. Hence they have a more robust appearance, a much thicker coat and a rougher coat of hair than the Angus oxen. Forfarshire is turnip country, and has its fields for the most part inclosed; the cattle are regularly kept in straw-yards during six months of the year, receiving their rations with their fodder every day, and in summer they are grazed in comparatively dry and warm pastures. By this mode of treatment they are healthy and feel more kindly than the Galloways.

The greater part of them are black or with a few white spots. The general colour is yellow, comprehending the brindled, dark red, and variously coloured yellow.

They are a valuable breed, and have rapidly gained ground among the horned cattle. They have become far more numerous than the Galloways, particularly in the Lowlands; and when the agriculturist now speaks of the Angus breed, he refers to the polled and not to the horned species.

One of the most spirited and successful breeders of the doddie cattle is Mr. Watson, of Keillor, by Meigle, in Angus, and to him we are indebted for much valuable information respecting the breed.

His stock of Angus cattle has deservedly obtained the name of the Keillor breed, and a most excellent one it is. He has gained on account of them, more than 100 prizes, besides several valuable plates. The facilities which will now be afforded by the establishment of the steam-carriage, will enable him and other enterprising breeders to send many beasts to the London market, which will find a ready and profitable sale there.

The following cut contains the portrait of one of a pair of oxen exhibited by him at the show of the Highland society at Perth, in 1829, and which obtained the prize as "the best pair of oxen of the Angus breed." It was afterwards sent to the Smithfield show, at the Christmas of the same year, when he was particularly admired. The butcher who purchased them, Mr. Sparks, of High-street, Mary-le-bone, with whom we have consulted on the subject, and who may be considered to be a competent judge, after he was slaughtered, that he was one of the best quality he ever saw, and he thought must have been the best of the breed that ever exhibited. The meat was finely grained, and there were more than 240lbs. of fat



[*Angus Ox, fat.*]

fair specimen of an Angus bullock, in good store property of Mr. Clarke, a dealer in polled cattle.

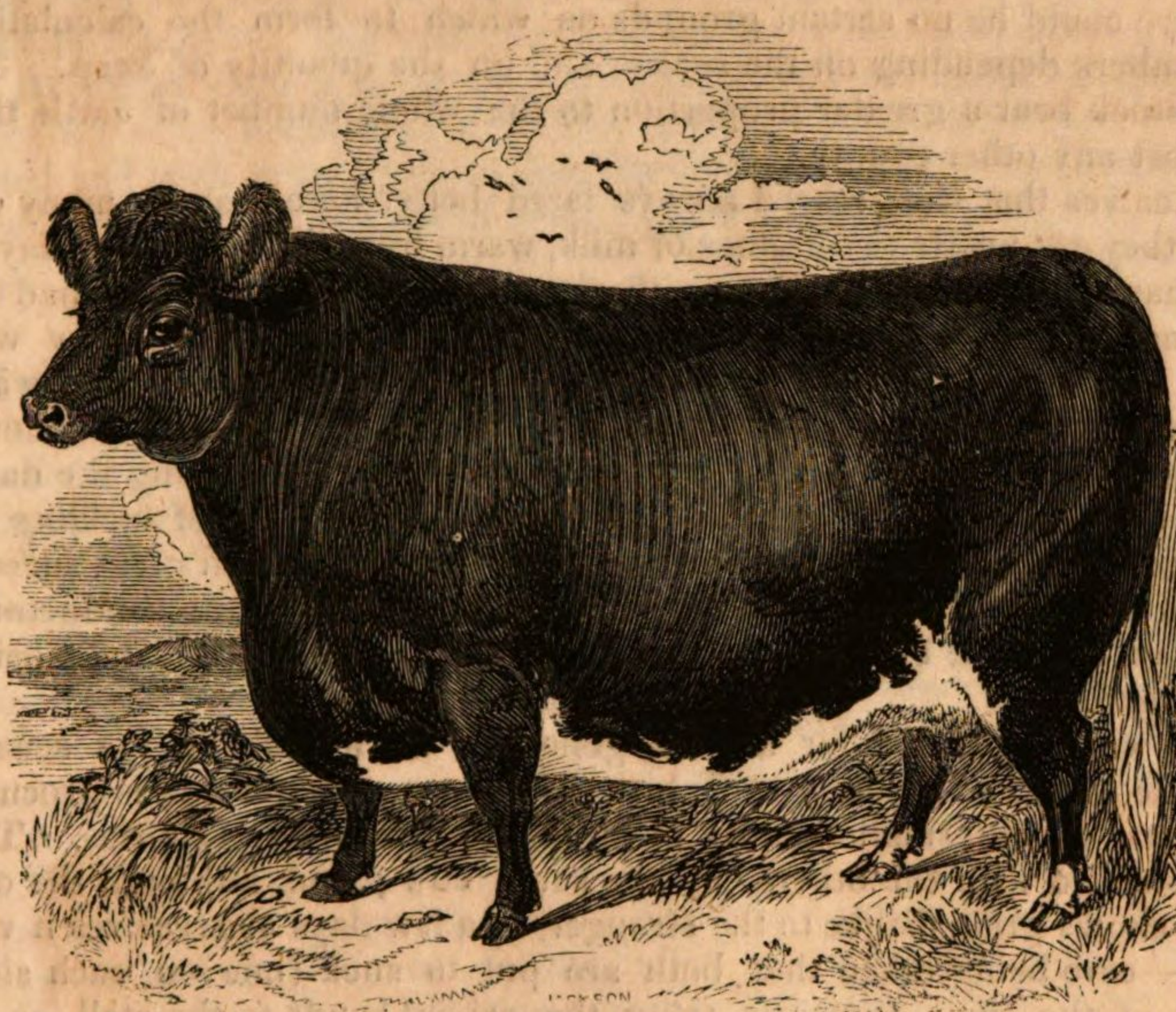


[*Angus Ox.*]

gives us the portrait of a heifer, bred and fattened by
s exhibited at the same show at Perth, and obtained

are
Ke
bre
ow
of

reta
Mr.
exc
the
†
Agr
the
Mr.
of a
mee



[Angus Cow.]

We must, however, acknowledge that the Angus polled cattle generally are not of that very superior quality and value which this account of the Keillor breed would seem to indicate, or, what is the case with many other breeds, they are exceedingly valuable in their own climate and on their own soil, but they do not answer the somewhat unreasonable expectations of their purchasers, when driven to the south. They have yielded

* She was out of a very small cow with a remote dash of Guernsey blood in retaining all the best features of the pure Angus blood. The bone of her fore leg, Mr. Watson has in his possession, was not thicker than that of a red deer, and she was exceedingly active to the last. When killed her breast was not quite 8 inches clear of the ground, and her inside fat was equal to a quarter of her whole weight of beef.

† At one year old this beast gained a prize at the annual show of the Strathmore Agricultural Society at Coupar, Angus; at two years old he also carried off the prize at the next show of the same society. At three years old he and another ox, also of the same breed, Mr. Watson, gained the first premium of the same society for the best pair of oxen of any breed; and in the same year the same pair were shown, as we have stated, at the meeting of the Highland Society at Perth.

count of Angus it is said to contain 45,400 cattle ; certain grounds on which to form the calculation, on the season and on the quantity of keep. The greater proportion to the whole number of cattle than in any other county.

The calves are always reared better here than in many districts. They receive two gallons of milk, warm from the cow, every day for the first six weeks ; and were then put on the best grass, and had turnips sometimes only straw, in the winter, when they were housed. The cows were also generally housed, except there was a little other fodder, when, and especially in the hilly country, they were allowed to wander over some rough pasture during the day.

Twenty years ago, introduced the practice of suckling the calves, and has since continued the system with great success. It is described by himself in a letter to the conductor of the Highland Society, under the patronage of the Highland Society.

He is now employed for nursing generally calves early in the season, in January or February, when a stranger calf is procured from all tenants in the district who have dairies. This is done by the same cow ; and, although the cow is not like to the stranger, in a few days she receives it very well, so that both are put to suck (one on each side) at the same time, by tying the calves' bands to the stall, or the cow's bands to keep each calf at its own side. They remain in the stall for ten or twenty minutes, by which time her milk is perfectly fresh. As the calves advance in age they eat hay, sliced potatoes, and other food that they are inclined to take. By the 1st of August, when the grass is ready, they are weaned and turned out from the stalls. Fresh calves are immediately put into their stalls and milked, excepting that they are turned out at 12 o'clock, when they are allowed to suck, to eat grass, and are brought into the byre when the cows come in to be sucked. This set is made on the 1st of August, and a single calf is put into the feed for the butcher, the season being now too late for the others. After the calves are fed off, the cows are let off milk, having each received a full milk. It is necessary to have a very careful and steady person to suck the calves, which has to be done three times a day, viz., before the cows are turned out to grass, at mid-day, when the cows come into the byre for the night and get a full milk, or other green food. The byre is arranged so that the

generally the case in this part of Scotland, is good, but the ch
and ill-flavoured. No oxen are used on the road, and few for th

Although there is so great a mixture of different breeds in Fo
they are all of Scottish origin. The southern breeds have been r
tried and have failed, and so has the Guernsey, which has contr
much to the improvement of some English dairies*.

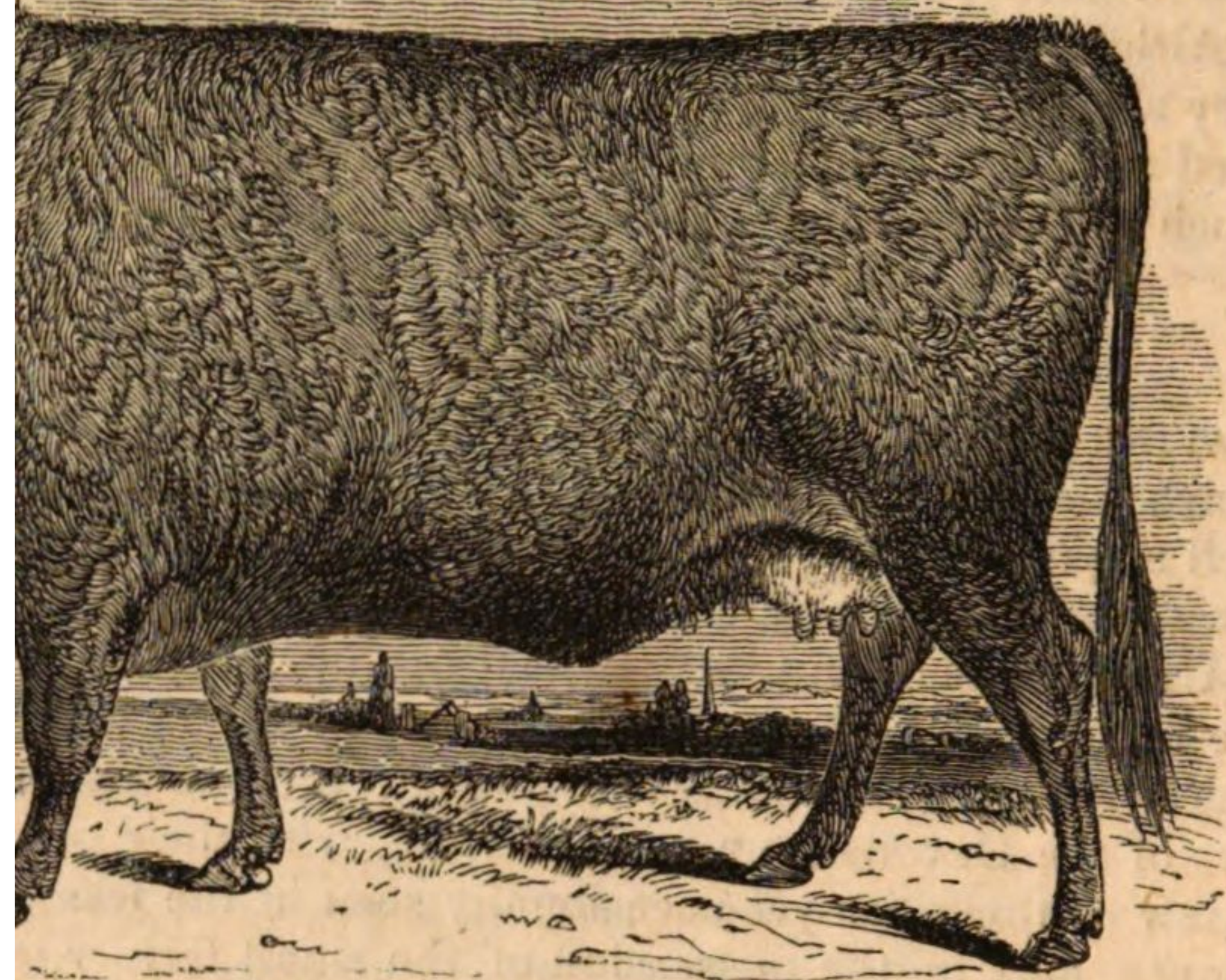
NORFOLK.

HAVING now returned to the districts with the character of the
which the greater part of our readers may be supposed to be
well acquainted, our description both of the peculiarities of the
the different counties, and the general management of cattle, will

Until the beginning of the last century, and for some years af
the native breed of Norfolk belonged to the middle-horns. The
was usually red, or sometimes black; they possessed many of th
ters of the Devons on a smaller scale, with their pointed, turned u
A few of them are yet occasionally seen in the less cultivated par
county, and in the possession of the small farmer or the cottage
have, however, been almost superseded by a *polled* breed.

We have stated that from a very early period, a great part of th
way cattle were prepared for the Smithfield market on the pa
Norfolk and Suffolk; nearly one-half of the beasts that supply th
polis come from these counties. Some of the Galloways, either
ally, or selected on account of their superior form and quality,
in Norfolk; and the farmer attempted to naturalize and to rea
own county, and he hoped at somewhat less cost, a breed of cattle s

* Some curious sports in nature have been observed in the breeding of Angu
One remarkable fact is stated by John Boswell, Esq., of Balmuto and Kingcaul
essay upon the breeding of live stock, communicated to the Highland Society
' One of the most intelligent breeders I have ever met with in Scotland, Mr M
extensive farmer on Sir James Carnegie's estate in Angus, told me a singular
regard to what I have now stated. One of his cows chanced to come into se
pasturing on a field which was bounded by that of one of his neighbours, ou
field an ox jumped and went with the cow, until she was brought home to the
ox was white, with black spots, and horned. Mr. Mustard had not a horned b
possession, nor one with any white on it. Nevertheless, the produce of the
spring was a black and white calf, *with horns.*' Another fact, which shows the
required in keeping pure this breed, is related of the Keillor stock, where, tw
seasons, a dairy cow of the Ayrshire breed, red and white, was allowed to pa
the black doddies. In the first experiment, from pure black bulls and c
appeared *three* red and white calves; and on the second trial *two* of the calv
mixed colours. Since that time care has been taken to have almost every anim
farm, down to the pigs and poultry, of a black colour.



[*Norfolk Cow.*]

a favourable specimen of them. The cow was bred
ton, in the neighbourhood of Norwich. This beast,
on to the censure which has been passed upon them
ed.'

care is taken in any part of this county to improve
been improved in many districts, not only in attain-
all ages, but in the quality of the meat being con-
it must be confessed that the Galloways afforded so
n to the Norfolk grazier during their temporary
ir journey to the Smithfield market, that the home-
a while, comparatively neglected.

ally a grazing county, and the cattle chiefly grazed
y Scots. The following estimate of the expense and
, is taken from the Agricultural Survey of Norfolk,
y Mr. Barton. The more complete establishment of
has made some alteration, and that in favour of the

le there are three sorts which require consideration ;
turned of four years old, and bought at St. Faiths,
at 9*l.*, and in such condition as to be fit to be put

weeks at 2s. 3d. per week, will cost 3l. 3s. more ; then to turn weeks at 3s., which will be 1l. 4s., and amounting in the whole to 12l. 2s. The weight of the bullock will now generally be about 44 stones value 12l. 2s.

A third lot is probably bought at Harleston in December. They are lean, of the same age, and the price averages at about 7l. They are sent immediately to the straw-yard, and fed on offal turnips 8 weeks at 1s. 6d. per week, and amounting to 12s. They then have full keeping, turnips by day, and the straw-yard at night, for 12 weeks which at 2s. 6d. per week, will give an additional expense of 1l. 5s. They then go into the two years' lay, or good pasture, for 20 weeks, at 3s. per week, 3l. more, which brings their cost to the grazier to 12l. 13s. They will now probably weigh 46 stones, which at 5s. 6d. per stone amount to 12l. 13s.

It would appear from these calculations that the first lot paid 15 per cent. interest on the capital laid out, and a fair price for what was consumed. The second yielded no interest on the original cost, but a fair price for the food ; and the third gave 15 per cent. in addition to the remunerating price ; but to this seemingly little profit must be added the increased value of the succeeding crops, from the great quantity of manure.

The grand fairs for the purchase of the Galloway cattle are at St. Faiths on October 17th* ; Hampton Green, November 22nd ; and Hemlinggreen on November 28th. The *horned* Scotch cattle are often grazed, but not to the extent of the Galloways. Mr. Marshall, in that valuable work 'The Rural Economy of Norfolk,' gives the following account of the sale of Kyloes. The buying and selling prices are now very different, but the proportion between them is nearly the same. 'How profitable is it to turn a little Isle-of-Sky cattle to the Norfolk farmer, who has rough meadows, and no other means of improving them to run in ? ——— had eleven, bought last Hemlinggreen fair twelve-months ago,) for three guineas a-piece. They were kept

* Mr. Marshall thus describes the Fair of St. Faiths :—

On Wednesday, 17th instant, I went to the first day of the fair of St. Faiths near Norwich, where one of the largest fairs in the kingdom is held annually for cheese and butter, and a variety of wares, but most especially the first, which draws in great quantities out of Suffolk to supply this country during the winter months. A Norfolk cheese is not to be purchased in this part of the country.

The first day of this fair also draws together a good show of cattle, principally bred, either for store or for fattening on turnips, and for which purposes a show of bullocks is also exhibited upon a rising ground at a small distance from the fair.

The sale of Scotch cattle continues for a fortnight, or longer time, until this time the county be supplied with that species of stock.—Marshall's Economy of Norfolk

is a fair remunerating price for the } 1 1 9
d and aftermath
mer bought a parcel at the same time, and at the
e refuse ones so low as five-and-twenty shillings
he sold a few days ago for 11l. 4s.

re followers at turnips the first winter. In summer
azing ground ; since harvest they have been in the
at good keep*.

re established themselves in many parts of Norfolk.
ught in to graze and others are bred there with con-
e Devons have zealous advocates in Norfolk. The
raw-yard and sheds rarely contain fewer than 60 of
nd Mr. Coke, while he selects the Devons for his
mployed in grazing and winter feeding the improved
ons are selected for whatever husbandry work is
Norfolk.

SUFFOLK.

used to be celebrated in almost every part of the
of the extraordinary quantity of milk that she yielded.
, however, although occasionally met with out of the
Suffolk, and rejected as an almost certain indication
eed, consistently with the title of the chapter under
s in general *polled*, but some of the calves would
e reared, and even in the polled the rudiment of a
at an early age.

e Norfolk beast, undoubtedly sprung from the Gal-
er in the leg, broader and rounder than the Norfolk,
ity to fatten, and reaching to greater weights. Mr.
r of 'The Suffolk Traveller,' published nearly a cen-
e Suffolk cow as having 'a clean throat, with little
, thin and short legs, the ribs springing well from
k, the carcase large, the belly heavy, the back-bone
and hollow, the loin narrow, the udder square, large,

of Norfolk, ii. 74.

ion with regard to this. We have seen many Suffolk cows
almost said to be clumsy, and who had their fair share of
t celebrated as milkers, and, being soon discarded on that
eat rapidity. There was too much of the Galloway blood

the Suffolk cow, but. nevertheless, she is not inferior to any other by the quantity of milk that she yields. In the height of the season these cows will give as much as 8 gallons of milk in the day; and 8 gallons is not an unusual quantity. The produce of butter, however, in proportion to the quantity of milk*. The Rev. Mr. Aspin, of Colchester, had three cows one of them a heifer with her first calf. They were on three acres only of grass, without any change of pasture until mowing time, and in the winter chiefly on straw with very little hay. The old ones yielded 8 gallons of milk per day during the height of the season, and the quantity of butter made from June to December was 683 lbs. The Rev. Arthur Young, the Secretary to the Board of Agriculture, forty years ago, adds, that one Holderness cow would have consumed all the food of the three, without returning half of the produce. There are a few short-horn cows, although far superior in size to the Suffolks, assuming nearly double the quantity of food, that will yield more milk than is usually obtained from the smaller polled breed.

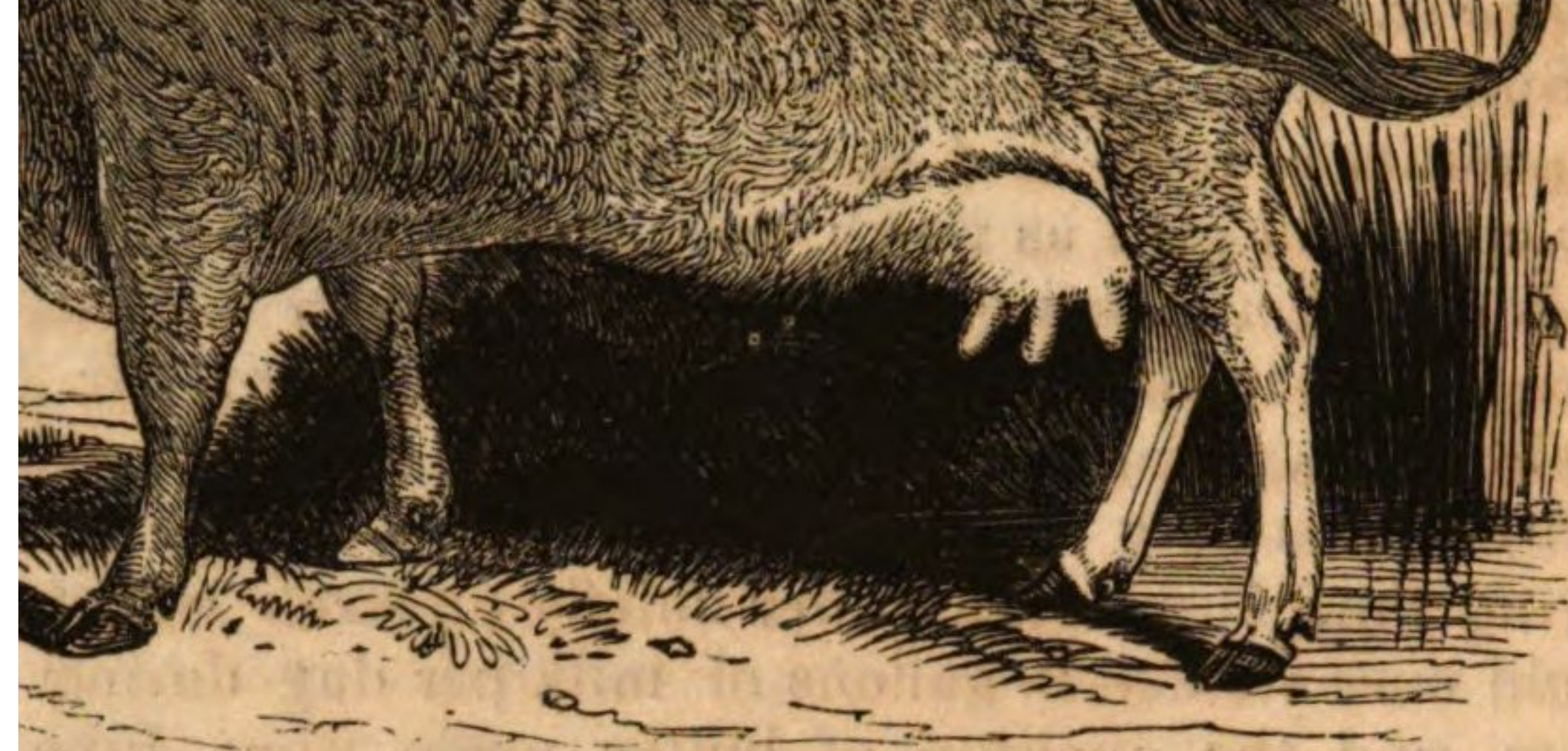
Fifty thousand firkins of butter are sent to London every year from Suffolk, of which each cow furnishes on an average three firkins, each containing $\frac{1}{2}$ cwt., with $\frac{3}{4}$ of a wey of cheese †.

* Some experiments were made by Mr. Chevalier, of Aspal, near Debenham, which would give a more favourable opinion of the richness of the Suffolk cow's milk. He took four quarts of milk from a Suffolk cow, and the same quantity from a long-horn of Mr. Culley's breed were set in separate bowls for 36 hours. The milk of each was then skimmed, and the cream from the milk of the Suffolk weighed $2\frac{1}{2}$ ounces more than that from the long-horn cow. The cream was after that put into two bottles and churned, and one quart more butter was extracted from the cream of the polled cow than from that of the long-horn one.

A variety of experiments, however, must be made before this question can be decided, and particularly in summer, when the milk of both is so much more abundant. The time which has elapsed from the calving of each should also be attended to, and the quantity of food of the animals. The milk of a cow that keeps herself in good condition is known to be more productive of cream and butter than that of a half-starved one, and possibly may yield a greater quantity of milk; and yet it may be questioned whether the superiority of quality always makes amends for the diminution of quantity. The extraordinary milkers are usually the very worst looking animals.

† Mr. Culley extracts from Mr. Young's Survey of Suffolk, an estimate of the value of one of the cows:—

	£	s.	d.
Three firkins of butter, each weighing $\frac{1}{2}$ cwt. at 32s.	4	16	0
$\frac{3}{4}$ wey of cheese	1	4	0
A hog		0	0
A calf	0	10	0
Total	7	10	0



[*Suffolk Cow.*]

by the majority of the farmers, much better attended to than Mr. Young wrote his 'Survey.' He says, that 'few in the winter to a cow-yard, but the cattle ranged over their pleasure, poaching the land dreadfully. Some-
they were tied up in the field, without house, or shed, or

A rough manger was placed on the ground in which s*, or straw was given to them, and small posts were und 3ft. 6in. asunder, to which the cows were tied. A set up before them, or they were placed before a thick screen them from the blast. They were regularly littered, piled up behind them in the form of a wall, which served screen; while a slight trench was dug at their heels to urine.' It was imagined that this was better than letting

Mr. Young calculating the butter and cheese at a higher price, makes

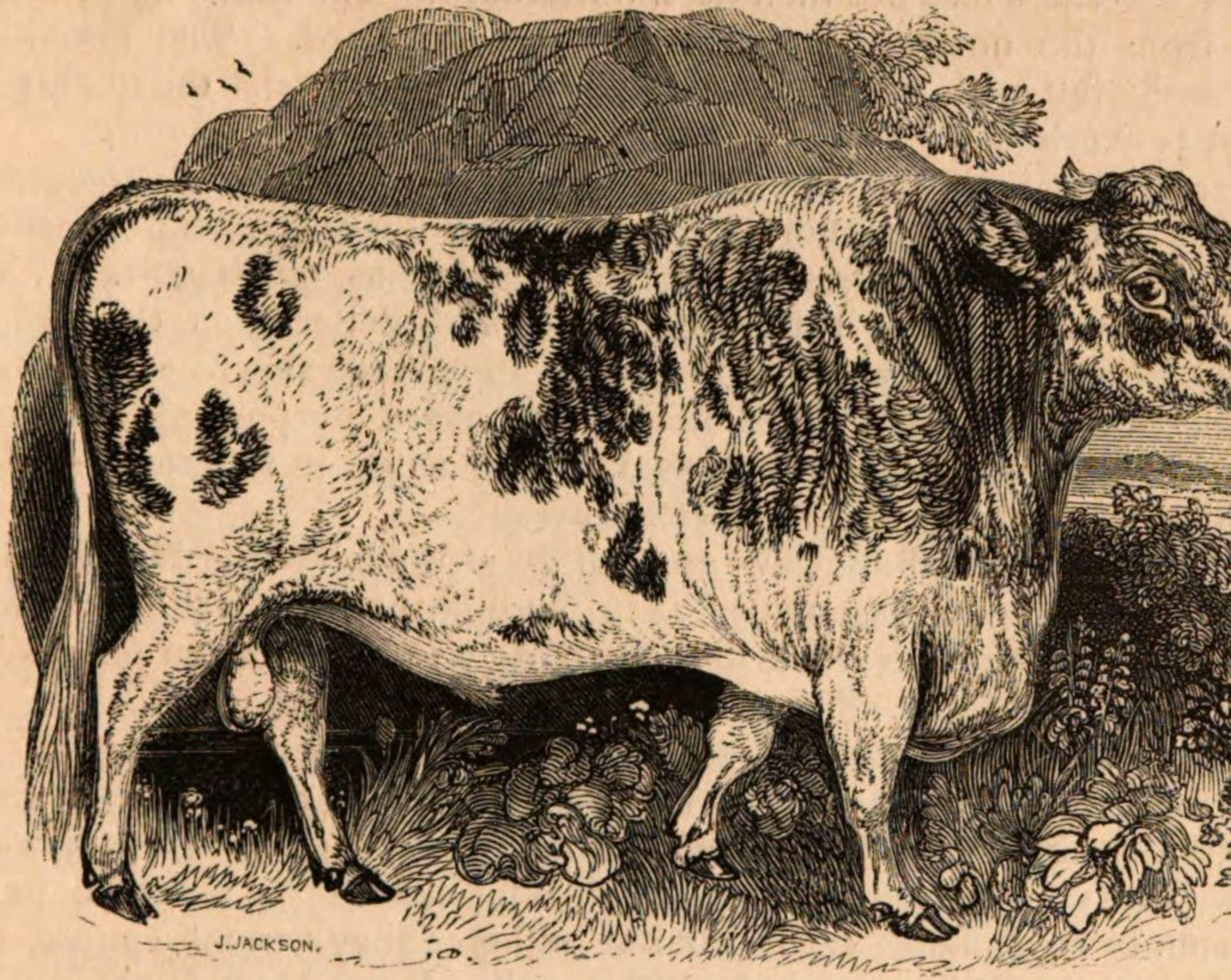
very excellent writer on the breeds and general treatment of cattle, ed upon when he speaks of their diseases, has the following very on this, vol. i. p. 119, which we have somewhat condensed. That the best of the cows give 24 quarts of milk in one day, and that for a year is only 7*l.* 10*s.*, the milk and the quantity of butter bear each other. There must be an error in the one; for if the produce calculated at half a year, or 26 weeks, the butter would be 184*lbs.*, would give 9*l.* 4*s.*; the hog would be worth, in other butter and and the calf about 15*s.* Skim-milk cheese fetches from 2*l.* 5*s.* to and Somersetshire, which would make the produce amount to nearer the truth than that stated by Mr. Young.'

792) the practice of growing cabbages was almost universal among the butter was sometimes bad when the cabbages began to be able did considerable damage to the succeeding crop. The culture of cows is therefore in a great measure superseded.

pr
ar
th
tic
be
fro

jec
sla
len
the

then offers a temptation which the farmer cannot resist; and the ones are fattened and disposed of as soon as possible. The selection is therefore made almost entirely from the later calves, and they have as good a chance as the early-dropped ones would have had of being strong and hardy before winter, and thus acquiring a good constitution and the certainty of thriving and yielding well.



[*Suffolk Bull.*]

Another instance of mismanagement is not always avoided even at the present day. He says that 'the bulls are rarely suffered to live after they are three years old, however excellent they may be, for the farmer believes that if they are kept longer they do not get a stock equally good, and particularly that their calves are not so large after that period.' Nothing can be more erroneous or mischievous. A bull is never in finer condition than from four to seven years old.

Beside this, the practice of the Suffolk breeders is subject to radical objection, for before the value of the progeny of a bull can be known he is slaughtered, so that if the cows got by him turn out to be the most prolific milkers, no advantage could be derived from the discovery, the stock being gone.

when thus discharged, poor and angular as she may be, rapidity, not equal, indeed, to that of the Galloways, could be expected from her gaunt appearance. Whence she yields so much milk, is a question that no one has asked; for the progenitor, the Galloway, has it not. The Holderness is concerned; for, more than a hundred years ago, the Suffolk was esteemed as a milker, as the breed of this county is at present, but had not then been introduced. The fattening property of the northern breed is not yet impaired. The discarded oxen weigh from forty to forty or five-and-forty stones, and the quality of the milk is not ^{at} *.

The property of the Suffolk has been supposed to be increased by the introduction of the short-horn; but although they are both excellent milkers, the property has been uniformly lessened as milch cows by the introduction of the short-horn, and the progeny, although better than the Suffolk, is decidedly inferior to the improved short-horn. Very few, however, are bred for the mere purpose of grazing; and what we have said of their value in this respect, they are inferior to the pure Galloways.

The Galloways are bought at the fairs after Michaelmas. The same management is pursued as in Norfolk, and the Galloways from Norfolk in their journey to the London market, in any part of the summer.

Welsh cattle, and a few Irish, are also grazed, both in Norfolk; but they do not bear so high a price in the market as the Galloways, and their meat, although very good, is somewhat inferior. Short-horns are also establishing themselves in some parts of the county as grazing cattle; but as milkers, they cannot contest the Galloways on their native soil. Some Devons are found, but not so numerous or such favourites as they are in Norfolk.

His lordship has a very fine dairy of North Devon cows, and he has procured the purest and most beautiful bulls from that county. In the year 1832, he gave two hundred and eighty guineas for a bull.

His lordship is also very successfully engaged in the feeding of the improved short-horn. Some very fine specimens were exhibited at the last Smithfield cattle show,

the best breed of polled cattle of sufficient consequence to mention here. Mr. John Lawrence, in his excellent

remarks,—‘The oxen of this breed weigh from 570 lbs. to 700 lbs.; and the cows from 560 lbs., and, in a general way, I do not find any beef before

CHAPTER V.

THE IRISH CATTLE.

BEFORE we enter on the consideration of the two remaining English cattle, the long and the short-horns, we will take a glance at the Irish cattle.

They are evidently composed of two distinct breeds; the mi the long-horns.

The former is plainly an aboriginal breed. They are found mountains and rude parts of the country, in almost every district are small, light, active, and wild. The head is small, although t exceptions to this in various parts, and so numerous, indeed, a exceptions, that some describe the native Irish cattle as having th and necks; the horns are short compared with the other breed, all fine, some of them rather upright, and frequently, after projecting then turning backward. Although somewhat deficient in the hind- they are high-boned, and wide over the hips, yet the bone genera heavy. The hair is coarse and long; in some places they a in others brindled; and in others black or brindled, with whi Some are finer in the bone, and finer in the neck, with a good sharp muzzle, and great activity.

They are exceedingly hardy; they live through the winter, and times fatten on their native mountains and moors; and when re a better climate and soil, they fatten with all the rapidity of the al cattle of the Highlands and Wales. They are generally ve milkers, and many of them are excellent in this respect. The Kerry, with a portrait of which the reader is here presented, is a fa specimen of them. Where they have much of the Kerry blood their very wildness proves them to be the native breed; for the fence nor ditch which they will not leap.

The cow of Kerry is truly a poor man's cow, living everywhere yielding, for her size, abundance of milk of a good quality, and rapidly when required. The slightest inspection of the cut will

elled by any other breed.

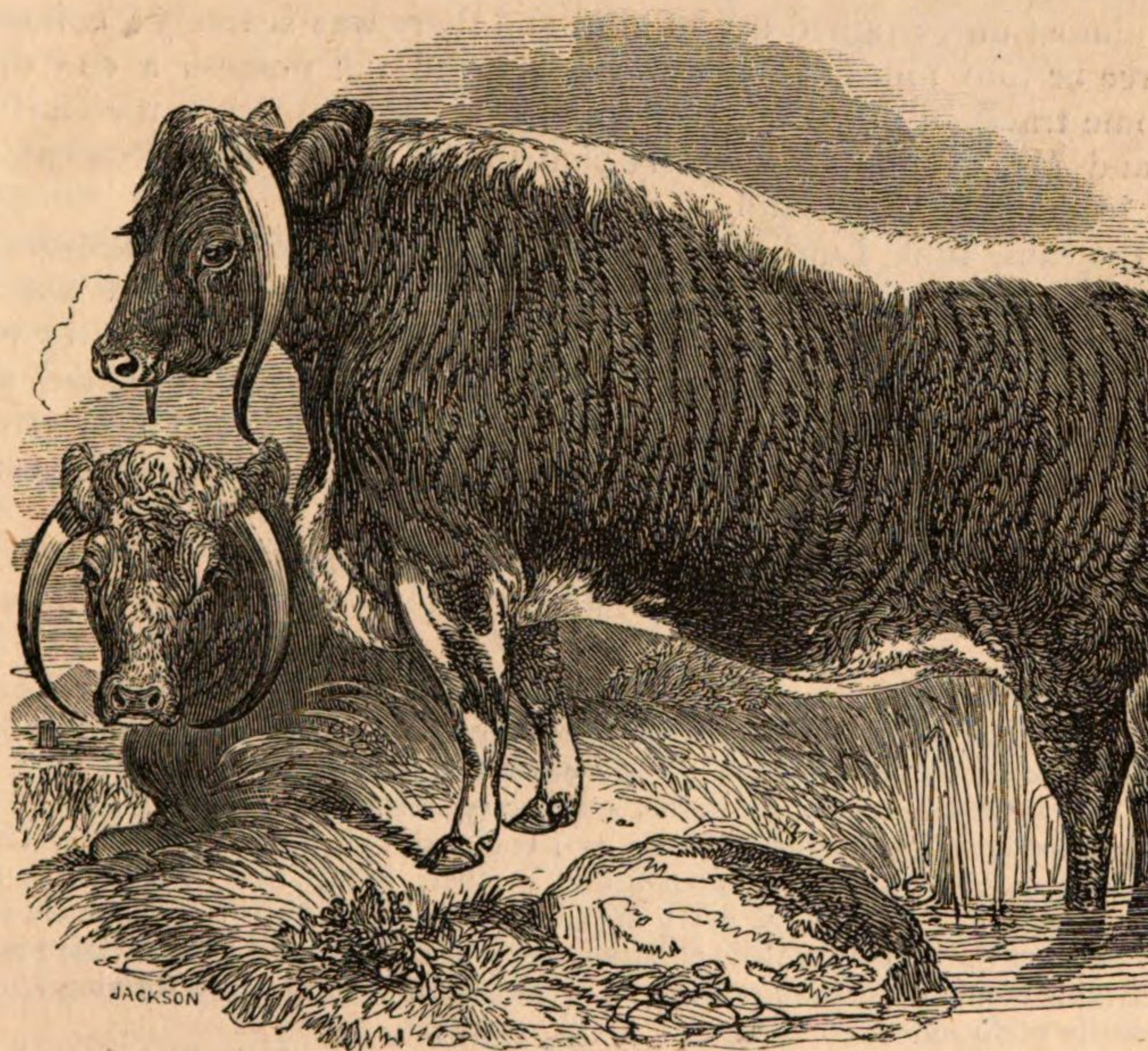


[*Kerry Cow.*]

elmont, in Wexford, informs us, that this breed is now pure, except inland on the mountains; being nearly pure in the more civilized parts of the country, by repeated crosses with the Hereford, and the Devon; but that for the dairy, all are those cows which show most of the native Irish blood. It is to consider the middle-horn Irish as a mixed breed between the English and the Welsh or Scotch, but most inclined to the

The Survey of Kildare, gives the following description of the native cow:—have a sweet, placid countenance,—a neat, clean horn,—head very straight at the head, tapering gently, and increasing where it meets the eye to cover it,—shoulders flat, and thin in the blade,—chine not too high, and full at the breast,—ribs rising roundly and swelling from the side, the hip not too wide, and nearly concealed by the high arching of the ribs,—the couples,—hind-quarters broad and lengthy, narrowing gradually to the point,—should lie snug between the bones, the quarters on the outside of the ribs, but not extending too low,—legs fine, and clean in the bone, but

Meath, a great part of Munster, and particularly in Roscommon, these cattle are found, of which, although we cannot say with the authority of the Survey of the county of Dublin, that 'the cattle of Ireland are in such a progressive state of improvement, that in a few years they will be out-done, and will finally resort to us to improve their breed,' yet we can affirm that they are most valuable animals.



[*Irish Cattle.*]

Whence these long-horns originally came, is a question that is much disputed. There is no doubt that they very much resemble English long-horns, and have been materially improved by them. Whether Ireland or England was the native country of this breed will never be determined. Ancient records are silent on the subject; and in all countries we can trace the long-horns to a very remote period. At very early times Ireland has materially contributed to the supply of the British capital and the British navy, and thousands of Irish cattle yearly traverse almost every part of Great Britain, from Port F

of embarrassed and starving tenants or little land-
pressed in the slightest degree.

ry ago, some zealous agriculturists in Meath com-
f improvement. Mr. Waller introduced some of
a few of which long remained in Allenstown. Sixty
amesake and successor of his brought over one of
eed. He permitted his neighbours and tenants to
strained use of him, and there was scarcely a cottager
hiles of Allenstown, that did not possess a cow dis-
the Leicestershire blood. Mr Lowther, the Earl of
ble, successively contributed to the improvement of
of Ireland.

ie, Lord Massarene introduced some fine long-horned
in 1775, Mr. Lesly, of Lesly-hill, imported one of
; and the cattle of the neighbouring country was
improved. The Marquis of Donegal imported an-
rom the stock of Mr. Astley. Mr. Watson, of Bros-
y crossed the country cows with a valuable Leicester

as zealously employed in improving the cattle of
ng opposed by the not unfounded apprehensions of

y of Londonderry, gives an interesting account of this custom of
ious effects. ' One great obstacle to improvement, and which is
their notion of the equal and unalienable right of all their
ce of their father's property, whether land or goods. This
able in theory, but so ruinous and absurd in practice, is inter-
in the very constitution of their minds, that it is next to im-
in spite of every argument, the smaller Irish landholders con-
among their children, and these divide on until division is no
the course of two or three generations, the most thriving family

farmer who held about thirty acres of arable land, in one of the
had two sons, between whom, according to custom, he equally di-
thus barely able to support them and their families. One of
is, among whom, during his lifetime, he also divided his fifteen
an equal share. Here then were five persons with three acres
e sons, considering himself at once an established landholder,
e were five of the poorest and most wretched families that can
scope for their industry, trade or manufacture to employ
produce for them the common necessities of life.
urage this to increase their political influence. If the farm had
f the sons, and the others had been taught some useful trade,
given to them to set up with, all might have been respectable

on common hay and grass.

In Clare, Sir Edward O'Brien and Mr. Doxon of Fountain, M of Kiltannon, and Mr. Blood of Riverston, did much to render more valuable, by the importation of the improved Leicesters. common, the Messrs. Finch were particularly active in introducing Lancashire, Leicestershire, and Warwickshire cattle.

Almost every county and barony of Ireland had its zealous successful improver of the native breed, until, in the richer and more cultivated districts, the cattle became of as great a size and as perfect as any which the midland districts of England could produce.

There were, however, either two distinct breeds of long-horns, or capable of rapid improvement, while the other, in a manner, sacrificed every means to add to the size, or give a tendency to early maturity, or there were found too great a proportion of agriculturists who not only refused to adopt the proper means for the amelioration of the stock; or there were many districts into which the improved long-horns rarely, or to a very inconsiderable degree, penetrated. From all of these causes it happened, that there are at the present time two kinds of these cattle in Ireland, in character essentially different, the larger, which we have described, and a smaller, prevailing principally in the north of the island. At first view, perhaps, these would be the same cattle, only smaller from poor keep and bad management, but their horns, long out of all proportion, their clumsy heads, large and thick hides, their bulkiness of dewlap contrasted with their smallness of carcase, in fine, an accumulation of defects about them, classed them as being of far inferior value.

Thousands of them, and more perhaps than of the improved breed, are sent by their way to the midland counties of England, in order that some may be made to prepare them for the metropolitan market. The purchase of them is quite a lottery, or demands great skill and experience. Occasionally they will thrive to a degree not much inferior to the Welch cattle, while at other times a lot of them may be put on a fattening pasture as any in England, and be continued there through the summer, consuming almost as much food as the largest ox, and scarcely improving in condition.

In process of time, the English long-horns, although of the Bakewell breed, began to lose ground even in their native country, rather a rival with somewhat higher pretensions appeared in the improved short-horns began to attract the attention of the public, and their propensity to fatten, and the comparatively earlier maturity which they arrived at maturity, soon became evident. There

return, and where he could house and feed them
er had too much to alter in the system of treatment
refathers had been accustomed; and he often had
et the requisite change, or if he had, his prejudices
em.

the short-horn, however, becoming more fully esta-
other attempts were made to introduce him into
riments were more systematically conducted. Mr.
, to whom we are indebted for some valuable infor-
improvement in Donegal. The pure short-horn
for the severe weather and inferior food which they
in that mountainous district; but a half-bred stock
improved the shape and increased the size of the
oduced a better price. Mr. Conolly sent four bulls
ounty, and they were highly approved. The prizes
ty of Donegal were adjudged to them, and their
oduced more attention to the care and feeding of

that 'within the last ten years the breed has been
crossing with the Dutch, the Ayrshire, and the Dur-
improvements are mostly confined to the gentlemen
the smaller farmers (who are the majority of the
that the short-horns require too much care and
milk is not so good as that of the native breed.'

the management of cattle in Wexford, Mr. Walker
nt of that which takes place over a great part of
are small, and the occupiers of them have little
ept in summer, when grass is plenty, the cattle live
d to hardships.' For the same reason, the calves
tinted in their growth; but this does not appear to
qualities. They generally go to the bull at a year, or
so that they come into the dairy at two, or rising

ed abroad on grass in the summer*. Some of the

is 'Survey of Londonderry,' published in 1814, thus speaks of
cost of these summerings: 'The grazing of cattle is paid by the
understood, the grazing of a cow when above three years old.
nds of cattle are estimated by this in the following manner:—
e equal parts called feet, which is thus applied. A year-old
-year old, two feet; a summ is three feet; a horse is five feet;
e; six sheep, or four ewes and four lambs, the same; 24 geese
f 6s. be the price of a summ, a year old will be 2s., a two-year

five hundred weight, (Mr. Walker states that the average weight of a Wexford cow is about $4\frac{1}{2}$ cwt.)—but they might be greatly improved if proper attention were paid to them; for the calves, after the two weeks, are generally reared upon butter-milk, and then left to sustain themselves; only they have a little hay at night in winter.'

Mr. Anderson adds that 'the breed is considerably improved in a few years, by crossing with the Durham and Ayrshire.' Lord Wicklow's stock consists almost entirely of the Durhams, much to his credit; he gives his tenants the free use of his bulls without charge; and, encouraged by the improvement that has taken place, he purposes not only to continue but to extend the system.

Soiling in the house is not much practised in this district; but in the summer, and hay in the winter, constitute the mode of feeding, except that some of the graziers keep up part of their pasture for winter cattle, which they retain at the end of the season. These run out in all weathers, and have cribs fixed in the field to give them hay in a night, but they have no shed over them.

Lord Wicklow, who stall-feeds with turnips, mangel-wurzel, and potatoes, prefers the latter. The calves are reared on the cows, or have milk given to them from the pail, and they are housed in winter, and fed with hay, with a few turnips or mangel-wurzel, each day.

Lord Dunally, in a letter with which we have been honoured from Dublin, says, that 'in Tipperary he has kept the North Devon cattle for many years, and much approves of them for feeding, for the dairy, for work, and also for hardness, or quality to bear bad weather.

His Lordship states, that the usual weight of the native cattle when fattened, is about five hundred pounds. He also gives a favourable account of the grazing properties of these cattle. He says, that 'they are

old 4s., a horse 10s., and so on. The charge for a summer in the mountains, from November, varies from 6s. to 16s., according to the goodness of the pasture. In the case of cattle which are kept up for fattening, it is from 2l. to 2l. 10s.'

* Mr. Rawson gives the following account of the strange privations to which the cattle are sometimes exposed. 'The droves of cattle when turned out are generally kept by a solitary herdsman and his boy, who are obliged to keep boundaries. Hay is not dreamed of as necessary; and in case of deep snow of long continuance, the bullocks have nothing to resort to but coarse grass on undrained and unimproved mountain wet lands, which have scarcely been trodden on during the previous summer. No rape, or even straw are never thought of; nay, an extensive grazier would laugh at the idea; he would call your folly, if you doubted the health of his bullocks on his coarse pasture. Houses or coverings of any kind are not thought of. Yet after all these severe privations, and thriftiness, when at four years old, they are put to fatten about the 1st of May, and in five months are made fit for slaughter.'

which succeed admirably in that district.

Larn, in Antrim, tried a Highland bull, but the breed either for the dairy or the butcher.

There is no country in the world which, in proportion to its extent, contains so many cattle or possesses so extensive a trade in produce, as Ireland does. In 1812, no less than 1,000,000 cows were exported from Ireland, constituting full the beef consumed in England, and stated to be of the value of 9,128,000 £ . From that period, the number seemed to be declining. In 1824, there were only 62,393 oxen and cows exported; there were 63,524, and of the value of about 350,000 £ . It can be given, for the traffic between Britain and Ireland, the footing of a coasting trade: the numbers, however, were fewer than they were in 1825.

With the establishment of steam navigation, many inconveniences attended the transport of the Irish cattle. Many of them were driven a hundred and fifty miles to the coast, where, if contrary, they were detained perhaps several days, with a scanty allowance of food. They had none on the voyage; and when they reached the English shore, they were often in a starved state, and in a wretched condition. This may be placed in another point of view. The English fed cattle are sent to some of the markets, especially those on the western coast, and especially Liverpool, &c. From the scarcity of food and water, they do not attain to the same state of fatness; they have a long way to be driven, and are supported on the road. In Ireland, they have had a free grazing, never wanting grass or water,—and the finest breed now almost extinct in this country, are sent in a wretched condition. Such is the facility of conveyance, that a cargo of fat cattle will leave Ireland one day, and be cleared out in good time on the following day.

This transport of cattle for the graziers in England, and the immense quantity of beef, for the navy and merchants' stores. During the late war, the cattle slaughtered at the navy were, perhaps, more numerous than all that were sent in every other way. Mr. Culley saw at one fair at Drogheda, 35,000 head of cattle, and half of them were bought up for slaughter at Cork.

The mode in which the business between the grazier and the factor was often transacted, we subjoin in a note of curious account, extracted from Dutton's Survey of

serious losses from the cheating of every person concerned in slaughtering these; it is scarcely known in other parts of the kingdom, it may be at least amusing the business a little. The grazier, finding no agent attending the fairs to buy some trusty friend of the merchants, who reads a letter from Cork or Limerick, the rumours of a peace or the expected very low price, is obliged to drive his beasts to either of these markets.

After driving them into either of these towns, he waits upon the great man with all humility, begs to know if he wants any fat cattle; after a good deal of hurry of business, and waiting for a repetition of the question, 'he believes he will want anything more than what he has already engaged, but to oblige Mr. — he will endeavour to make room for them as to the price, it is to be regulated by what other graziers receive.'

When this is settled, he must drive his beasts to a slaughter-house, many of which are erected for this purpose. He pays for this a high price, and must give also for the skin and offal. He must sit up all night, superintending the slaughtering, and must observe every species of fraud committed by the very worst kind of butchers; frequently happened, if resentful language is used to those scoundrels, they will whet their knives, and put themselves in an assassinating attitude. This in a slaughter-house at night, and amongst the horrid scene of carnage around him, requires a small share of nerve.

Next morning, without taking any rest, he must bring his meat to the butcher here, unless they are feed, begins the second part of the fraud he has to suffer. The butchers take for their perquisites several pounds of his best beef; and if he has cows, they are well paid, will cut away large quantities of the udder, which they call the cow's tail, which is the property of the merchant, though he pays nothing for it. The butcher also gets the tongues; and if, perhaps, the grazier wants a few, must buy them at the rate of three shillings each.

The third scene begins at the scales: here another perquisite must be paid, if good meat is refused, because, truly, it should be a few pounds less than the weight per beast.

An appeal then is made to the great man, — 'he is gone out,' — 'he won't be seen to-night,' — 'he is so busy he can't be seen;' at length, perhaps, he is visible, — the matters are explained, — 'Really, Sir, I do not wish to take your cattle; the prices we receive in England are so low, I shall lose by my contract; suppose you would sell to me, I could do better elsewhere, but I will agree to take your beef, though below the market, if you make the terms lower.' The grazier has now no redress, and must agree to the terms. The business does not end here. Then he enquires what mode of payment is best. Bills at ninety-one days are the best terms he can get. He then applies to a clothier to buy his fat. When this is settled, the tanner must be waited on; and here, as with the Chandler, bills at a long date are the only payment he can receive; and as they are generally men of small or no capital, if their speculations should not succeed, the bills are worth little.

This is but a small part of the gross indignities the grazier has to suffer. He is obliged to transact a business totally foreign to his habits of life, consequently unable to do so as those, who, from their infancy, are used to the tricks practised in this business, are therefore, able to avoid them, or turn them, perhaps, to their own benefit. The price of the beast depends, not only on the causes before-mentioned, but on the size of the beast, — a large size bringing more per cwt. than those of a smaller one, which is a prejudice of a large bone; and cows are always lower in price than oxen, though they are sold in the same packages; and, if fat, go as the best beef, called planter's

CHAPTER VI.

THE LONG HORNS.

Craven, a fertile corner of the West Riding of Yorkshire, Lancashire, and separated from Westmoreland chiefly by the Wharfe, there has been, from the earliest records of which we have any, a peculiar and valuable breed of cattle. They were distinguished from the home-breds of other counties, by a disproportionate length of horn. In the old breed this horn

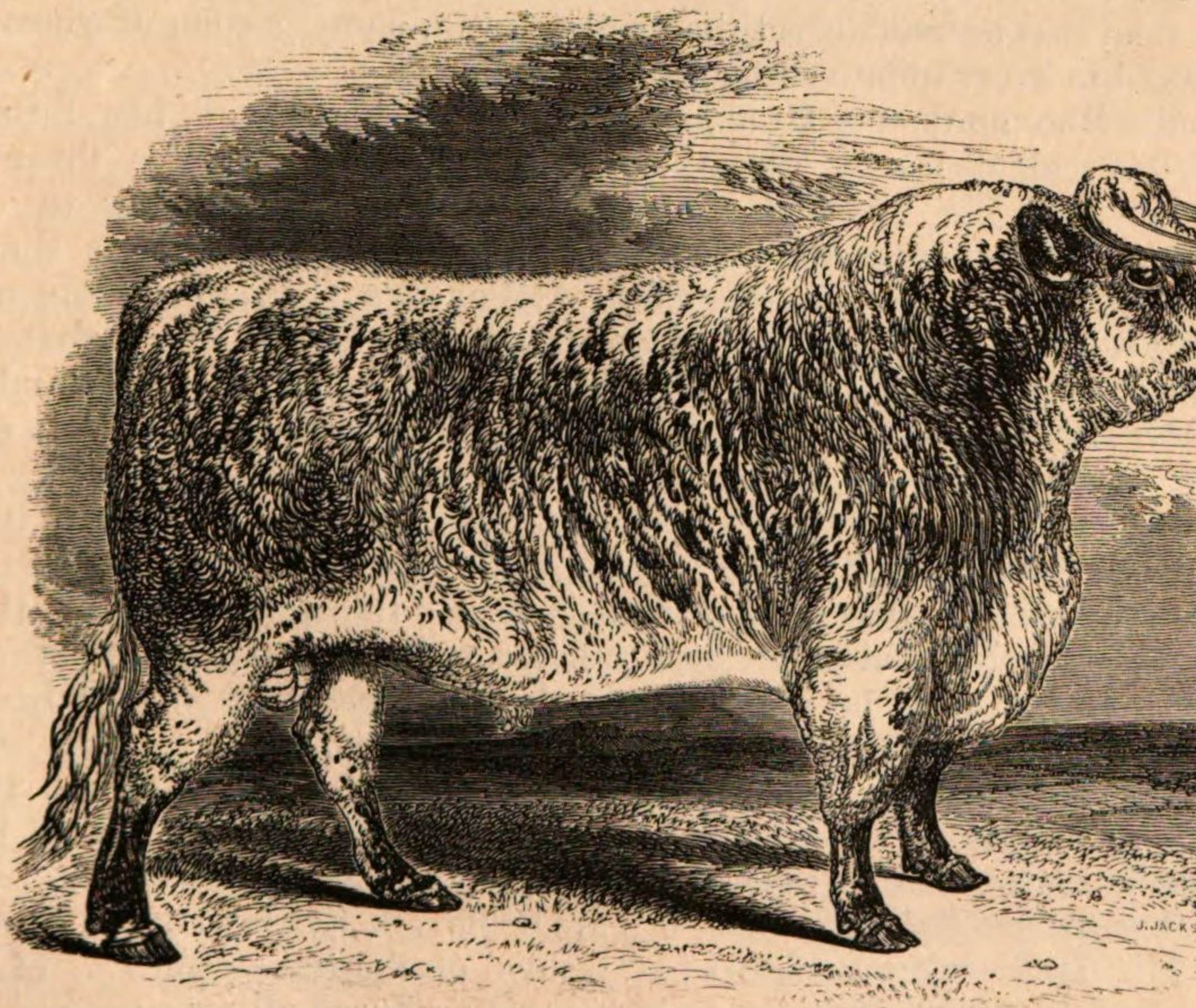
hung nearly horizontally on either side, but as the cattle improved, the horn assumed other directions; it hung down so that the cattle could scarcely graze, or it curved so as to threaten to meet between the ears, or so also to prevent the beast from grazing; or it curved upwards, and so to lock the lower jaw; or the points pressed against the bones of the nose and face, threatening to break. We have given a similar description of the improved breed, and in proportion as the breed became improved the horns became more and more distinguished by the name of

The cut of the Irish cattle in page 181, will give no notion of their general appearance and form. Cattle of a similar breed were found on the districts of Lancashire bordering on the south-eastern parts of Westmoreland; but tradition points to Craven as the original habitation of the breed. If there gradually arose any difference between the Craven beasts and the broadest in the chine, the Craven beasts were the broadest in the chine, the most docile, and the quickest feeders; the Lancashire ones were the most active in the quarters, but with a fall behind the shoulders, and a rise in the chine.

From whence the breed was derived was and still is a disputed point. Our opinion has been already expressed when treating of the

It seems to have first appeared in Craven, and gradually spread along the western coast, and to have occupied the midland counties.

perfect there. The Cheshire, the Derbyshire, the Nottinghamshire, Staffordshire, the Oxfordshire, and the Wiltshire cattle were all essentially long-horns, but each had its distinguishing feature, which seemed to fit it for its situation, and the purposes for which it was bred. Each assumed a decided character, varying only with peculiar local circumstances. The old long-horns, like the Devons, the Herefords, and the Scotch, continued nearly the same. There is no authentic detail of their distinguishing points. Mr. Culley says that 'the kind of cattle most esteemed in Mr. Bakewell's time were the large, long-bodied, big-boned, coarse-sided kind, and often lyery or black-fleshed.' This, however, is rather severe a censure on the Cravens or Lancashire beasts of that day. From the hints given by old writers, we may conclude that some of them were characterized by their roundness and length of carcass, coarse bone, thickness and yet mellowness of hide, and the rich quality and not abundant quantity of their milk.



[*Old Craven Bull.*]

house, a seat of Sir Thomas Gresley, on the banks
a mile from Burton. He prided himself much in
the care which he took in improving them and
the care; but a disease, which defied all remedial measures
cut and carried off the greater part of them, thus half
putting a final stop to his speculations.

Mr. Webster, of Canley, near Coventry, distinguished
himself. He too worked upon Sir Thomas Gresley's stock,
which he brought with him when he first settled at Canley.
He had great trouble in procuring bulls from Lancashire and
he is said to have had the best stock of cattle then known.
He says that 'he possessed the best stock, especially of
the kind, or ever will be bred in the kingdom.' This is high-
ly held as evidence of the excellent quality of Mr. Web-

ster. It is regretted that we have such meagre accounts of the
early improvers of cattle. Little more is known of Mr.
Webster, who established the Canley breed, some portion of whose
stock improved long-horn beast.

ROBERT, the HUBBACK of the long horns, and, like him,
was famous for the discovery of his value, was out of a three-
yearling of Mr. Webster's, by a Lancashire bull, belonging to a
yearling he was so unpromising that he was dis-
posed of by a person of the name of Bloxedge, (hence the name of
the breed) out a remarkably good stock-getter, Mr. Webster
had used him for several seasons. He was afterwards
sold to Mr. Deakenedge, in Warwickshire, and Mr. Flavel, of
Lichfield, died.

Mr. Webster is the chief improver of the long-horns, and to whom his
posterity have adjudged the merit of creating as it
is of cattle. It is a disgrace to the agriculture of the
country that he should have been suffered to pass away without some
recognition of what he effected, and the principles that guided him,
by which his objects were accomplished.

The account we have of Robert Bakewell is a fugitive paper in the
literature, from which every writer has borrowed, and his
source none has condescended to acknowledge. It
is said that Bakewell was born at Dishley, in Leicestershire, about
1724, and his grandfather had resided on the same estate. Hav-
ing seen domestic animals in general produced others possessing
similar to their own, he conceived that he had only to

clue. He tells us, however, that 'it is not his intention to deal with Bakewell's private opinions, or even to attempt a recital of his private practice.' Mr. Marshall was doubtless influenced by an honorable motive in withholding so much that would have been highly valuable; we can only regret that he was so situated as to have this motive present upon his mind.

He speaks of the general principles of breeding; and when brought into this in connexion with the name of Bakewell, we shall not be very far in concluding that these were the principles by which that great agriculturist was influenced.

'The most general principle,' he says, (we are referring to his *Economy of the Midland Counties*, vol. i. p. 297) 'is beauty of form. It is observable, however, that this principle was more closely attended to at the outset of improvement (under an idea in some degree falsely grown, that the beauty of form and utility are inseparable) than at present. Men who have long been conversant in practice make a distinction between a "useful sort" and a sort which is merely "handsome."

'The next principle attended to is a proportion of parts, or what is called *utility* of form in distinction from *beauty* of form; thus the inferior sorts which are deemed *offal*, or which bear an inferior price at market, are small in proportion to the better parts.

'A third principle of improvement is the texture of the muscular system, or what is termed *flesh*, a quality of live stock which, familiar as it has long have been to the butcher and the consumer, had not been sufficiently attended to by breeders, whatever it might have been by graziers. The principle involved the fact that the grain of the meat depended upon the *breed*, and not, as had been before considered, on the size of the animal. But the principle which engrossed the greatest share of attention, and which, above all others, is entitled to the *grazier's* attention, is *fining quality*, or a natural propensity to acquire a state of fatness at an early age, and when in full keep, and in a short space of time; a quality which is clearly found to be hereditary.'

Therefore, in Bakewell's opinion, every thing depended on breed, and beauty and utility of the form, the quality of the flesh and the propensity to fatness were, in the offspring, the natural consequence of similar qualities in the parents. His whole attention was centered in these points; and he never forgot that they were compatible with each other, and might be occasionally found united in the same individual.

Improvement had hitherto been attempted to be produced by selecting females from the native stock of the country, and crossing them with males of an alien breed. Mr. Bakewell's good sense led him to im-

and not pass before his stock was unrivalled for the roundness and the smallness of its bone, and its aptitude to acquire milk while they were small consumers of food in proportion to the same time, their qualities as milkers were very condensed. The *grazier* could not too highly value the Dishley, or long-horn; but the *dairyman*, and the *little farmer*, preferred as most useful for their purpose.

He had many prejudices opposed to him, and many difficulties, and it is not therefore to be wondered at if he was more embarrassed in considerable embarrassment; but he lived to see the success of his undertaking*.

He was verging on his seventieth year. His countenance beamed with a high degree of benevolence. His manners were simple, and well calculated to maintain the extensive popularity he acquired. His hospitality to strangers was bounded only by the means he possessed.

There are related of his humanity towards the various tribes of his management. He would not suffer the slightest act of cruelty perpetrated by any of his servants, and he sternly deprecated the practices practised by butchers and drovers; showing, by his own farm, the most pleasing instances of docility in every

of his and instructive work, 'Illustrations of Natural History,' we find a very serious, but too severe criticism, on Bakewell's system. 'It was his error, that the bones of an animal intended for food could not be too small, and that the most valuable part of the carcass, it could consequently not be too small. In defence of this leading theory, by inducing a preternatural smallness of carcass, he sought to cover the bones of all his animals with fat. Thus, the entirely new Leicester breed, from their excessive fatness, produce too small a quantity of eatable meat, and that, too, necessarily of inferior quality. They are in general found defective in weight, proportion, and if not thoroughly fattened, their flesh is crude and without flavour. They may be so, their carcasses produce little else but fat, a very considerable quantity, which may be sold at an inferior price, to make candles instead of food, not to avoid the waste that must ever attend the consumption of over-fattened meat. A sagacious improver, very justly disgusted at the sight of those huge, misshapen animals with which his vicinity abounded, and which required a great deal of time or quantity of food would thoroughly fatten, patriotically aiming at a more sightly and a more profitable breed; yet, rather unprompted, he was driven to the opposite extreme. Having painfully, and at much expense, reared a breed of cattle, the chief merit of which is to make fat, he has apparently been misled by his successors under the necessity of substituting another that will

The 'Gentleman's Magazine,' to whom we have before referred, says that of the different breeds of cattle could not escape the attention of any

ground oats, &c., and sometimes oil-cake, until cheese-making commenced, if it was a dairy farm; after which, whey porridge, whey in the field, being careful to house them in the night in warm weather was confirmed. Bull calves, and high-bred heifers, were suffered to remain at the teat until they were six, nine, or twelve months old, letting them run with their dams, or more for less valuable cows or heifers*.

Starting a few years afterwards, and rivalling Mr. Bakewell in value of his cattle, was Mr. Fowler of Rollwright, in Oxfordshire borders of Warwickshire. His cows were also of the Canley breed, of them having been purchased from Mr. Bakewell; and his bull speare, the best stock-getter that the long-horn breed ever possessed, got by D, out of a daughter of Twopenny, and therefore of pure blood.

Mr. Marshall gives the following description of this bull, and interesting and instructive one it is. It is a beautiful explication of the grand principles of breeding. 'This bull is a striking specimen of what naturalists term *accidental varieties*. Though bred in the

observer. It seemed to run through them all. At an age when most of his brethren were either foaming or bellowing with rage and madness, old C, a bull, a son of the Comely, had all the gentleness of a lamb, both in his look and action. He was the hand of his feeder; and if any one patted or scratched him, he would bow down almost on his knees.'

The same writer describes Mr. Bakewell's servants, one of whom had been 20 years, and another 32, and another 40 years. He likewise gives a curious account of Mr. Bakewell's hall. 'The separate joints and points of each of the more celebrated of his cattle were preserved in pickle, or hung up side by side; showing the thickness of the flesh and external fat on each, and the smallness of the offal. There were also specimens of the different breeds, that they might be compared with each other, and the difference marked. Some joints of beef, the relics of old Comely, the most celebrated stock, and who was slaughtered when her existence had become burdensome to the farmer, were particularly remarked. The fat of the sirloin on the outside was four inches in

Mr. Young, in his Eastern Tour, gives the following account of Mr. Bakewell's management of the cattle—'Another peculiarity is the amazing gentleness in which he managed these animals. All his bulls stand still in the field to be examined: the way of driving them from one field to another, or home, is by a little switch: he or his men walk by their side, and guide them with the stick wherever they please; and they are accustomed to this method from being calves. A lad, with a stick three feet long, and as big as a finger, will conduct a bull away from other bulls, and his cows, from one end of the field to the other. All this gentleness is merely the effect of management; and the same is often done by bulls is undoubtedly owing to practices very contrary, or else neglect.'

* Marshall's Midland Counties, vol. i. p. 358.

on, on examining, is occasioned by some remarkable
 rmed round the setting on of the tail; a circumstance
 e would be deemed a *deformity*, but as a *point* is in the
 n. The round bones snug, but the thighs rather full
 let down. The legs short and their bone fine. The
 out, (the chine excepted) large, roomy, deep, and well

art, he had every point of a Holderness or a Teeswater
 s horns have been changed, he would have passed in
 ordinary bull of either of those breeds. His two ends
 thought tolerably good, but his middle very deficient;
 ion, that had he been put to cows of those breeds, his
 e been of a moderate quality; but being put to cows
 e was full, (the lower part of the thigh excepted,) and
 s deficient, he has raised the long-horned breed to a
 on, which without so extraordinary a prodigy they never
 ed.'

t a form so uncommon should strike the improvers of
 ck, or that points they had been so long striving in
 should be rated at a high price. His owner was the
 is worth, and could never be induced to part with him
 inceps, who hired him for two seasons, at the unusual
 ineas a season. He covered until he was ten years old,
 h otherwise healthy, he became paralytic in his hind
 usequently, useless. His sire, D, at the age of 12 or
 ve than bulls usually are at three or four years old.

e of Mr. Fowler's cattle, in 1791, the following prices
 ne of the favourite beasts. This is a sufficient proof of
 which the improved Leicesters were now beginning to

	BULLS.	£.	s.	d.
ve years old		250	0	0
o years old		230	0	0
n, do.		215	0	0
ick, one year old		157	0	0
tan, do.		210	0	0
ick, do.		152	0	0

, according to the character of the short-horns at that time, but
 o strictly resemble them in their present improved state.

of the Canley blood, and he much improved his breed through the medium of Shakspeare, which, as we have just stated, he hired Fowler for two successive seasons. It was remarked, that every heifer of the Shakspeare blood could be recognized at first as descendant of his †.

Mr. Paget of Ibstock, in Leicestershire, should be added to the list of the improvers of the long-horns. His cattle were of the pure Rollwright blood, and consequently of the Canley stock.

Mr. Mundy of Derby must not be forgotten, whose cattle, not so large as some of the improved Leicesters, were excelled in beauty of form or aptitude to fatten ‡: and, last of all, mentioned

* Mr. Fowler used to conduct his business on the old principle of selling. Mr. Fowler shall say that Mr. Coke of Norfolk used to have all the cow calves he could sell for 500 guineas each, taking them when young; and in 1789, Mr. Fowler had ten bulls for which he refused 500 guineas. The practice of letting bulls originated with Mr. Fowler, and chiefly with Mr. Bakewell, and was generally adopted. The bulls were let out in April or the beginning of May, and were returned in August. The price was from ten to fifty or sixty pounds; but in one case, as we have just stated, a bull (Fowler's Shakspeare) was let at eighty guineas a season.

Some inconvenience occasionally resulted from this; and a bull that appeared to be a desirable one in the show-yard, was now and then returned, long before his time, over, not only as deficient in some material point, but as absolutely useless. Mr. Fowler shall very ingeniously account for this: he says that 'the breeder's object is to make his bull, to the eye at least, as near perfection as may be; he is therefore made to show by high keep, as well to evince his propensity to fatten as to hide his defects, thereby showing him off to the best advantage: the consequence of which is, that when taken from this high keep, and lowered at once to a common cow-pasture, he is found to be very deficient. Hence it is become a practice of judicious breeders, when their bulls are let earl, to lower them down by degrees to ordinary keep, previous to the season of em-

† Mr. Parkinson says, 'One of the greatest excellencies in Mr. Princep's cattle is their length, with smallness in their shoulders, giving so many fine cuts in the upper parts. Mr. Princep's cows are remarkably fat, so much so, I think, that a dozen of them were put in at the Smithfield show in their milking state, there were very few of the cattle exhibited, and made up for that purpose that would equal the eyes of the public.' Vol. i. p. 154.

We learn from the same authority, that Mr. Princep was bid 500 guineas for a year old bull, and thirty (another account says fifty) guineas a cow for the best bull to thirty cows, vol. i. p. 102. He was also offered 2000*l.* for twenty cows. A four-year old steer of Mr. Princep's breed, weighed 248 stones of 14 lbs. to the stone (424 stones Smithfield weight, or 3472 lbs.) In addition to this, there were 177 lb. fat, and the hide weighed 177 lb.

Another of Mr. Princep's oxen was fed by the Marquis of Donegal, in 1789, the four quarters weighed 1988 lbs., the tallow 200 lbs., and the hide 177 lbs.

‡ Mr. Parkinson bears the following testimony to the superiority of the cattle even at this early period. He is speaking of Mr. Mundy. 'There was one thing that prejudiced my mind much in favour of Mr. Mundy's cattle, viz., it was in the month of September that I visited his farm, and his park lying very conveniently situated



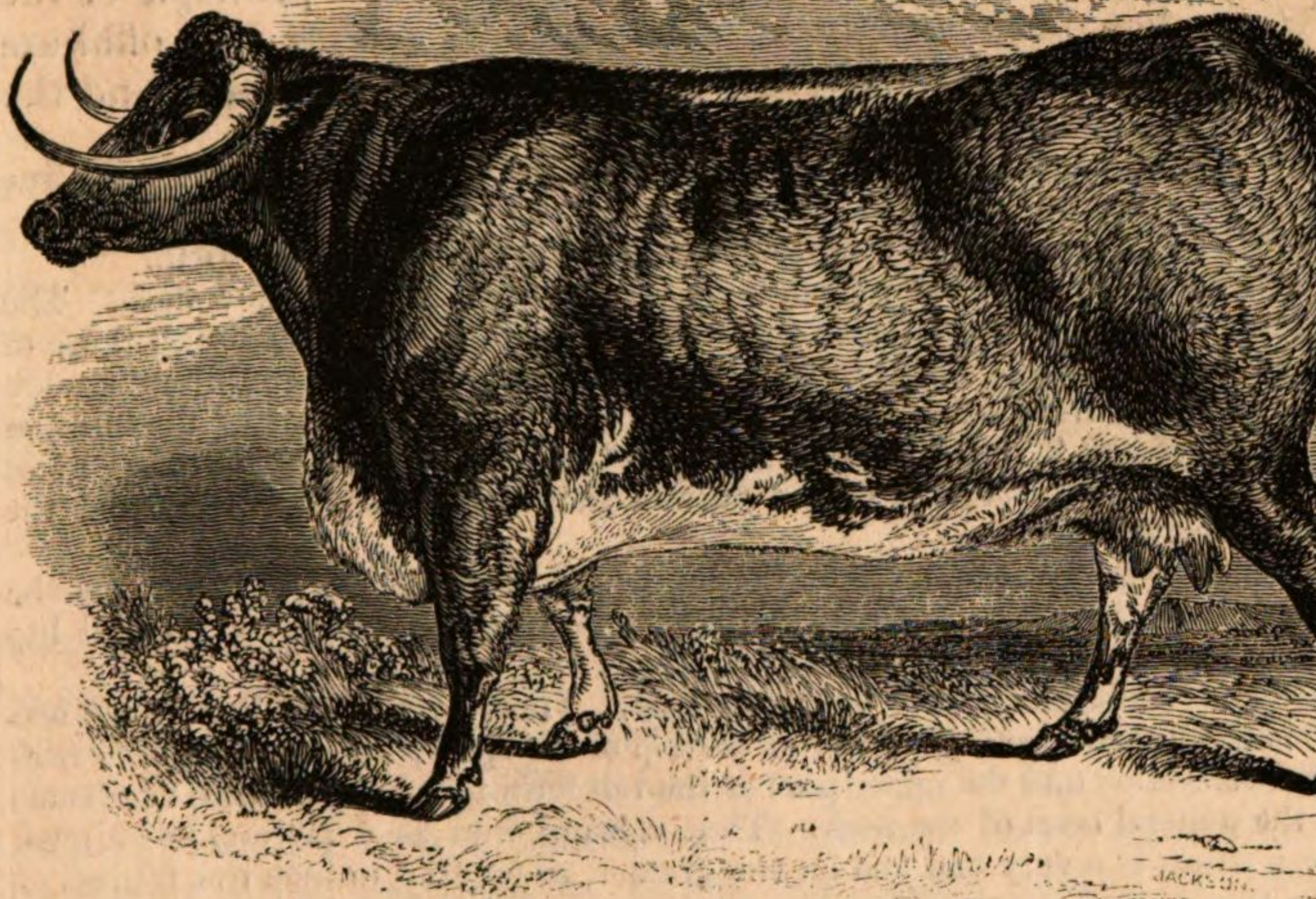
[*New Leicester Bull.*]

he following one, are taken from Garrard's beautiful sh oxen. Both the bull and the cow were of the pure were the property of Mr. Honeybourn, Mr. Bakewell's sor.

ome of this improved long-horn breed? Where is it was a bold and a successful experiment. It seemed for the most sanguine expectation of these scientific and

he permits them to pasture their cows in it. I think the number ighty; and as they probably belonged to half as many different ough of jobbers cow by cow and from various parts of the king- npossible that the whole mass of these cows could be selected of a y of them had grazed in the park all the summer, they had had a i, yet there was not a single cow in the whole number that had the ; while Mr. Mundy had some of his own cows pasturing among were fatter than any single cow could be found on some market- I do not know,' he adds, 'that a better trial, as an experiment, w the superior value of Mr. Mundy's cattle.' These cows could the pail, for one of Mr. Mundy's gave fourteen pounds of butter

owe everything to the new Leicester cattle. A new stock, in
arisen since the improved long-horns were grafted on the na
stock.



[*New Leicester Cow.*]

‘ Mr. Marshall, to whom, for a reason that will presently be stated, was
compelled again to have recourse, thus describes the improved
in his own time, which was that of Bakewell, Princep, and Fowl.

‘ The *foreend* long; but light to a degree of elegance. The
the chap clean, the head fine, but long and tapering.

‘ The *eye* large, bright and prominent.

‘ The *horns* vary with the sex, &c. Those of bulls are com
short, from fifteen inches to two feet; those of the few oxen that
reared of this breed, are extremely large, being from two and
three and a half feet long; those of the cows nearly as long,
finer, tapering to delicately fine points. Most of them hang
by the side of the cheeks, and then, if well turned, as many of
are, shoot forward at the points.

standing out full from the spine. The *belly* small**.
fails of being of the first quality.

middle thickness.

ous; the brindle, the finch-back, and the pye, are
ter they are, the better they seem to be in esteem ††.

quality of this improved breed, in a state of maturity,

ek, they undoubtedly rank high. The principle of the
been strictly attended to. The bone and offal are
d light; while the chine, the loin, the rump and the

excelled in this point. Some of the heifers had shoulders as fine

r's breed, however, were very fairly let down in the girth.

by accurate judges to be a criterion of good mellow flesh. The
the continuation of the ligaments of the neck, united with those of
(itself,) which in some individuals, when in low condition, stretch
from the setting on of the neck to the fore part of the loins, is
the flesh being of a bad quality. They are only proofs of great
nd, probably, in the animal generally; and indicating that the
tough.

projections of fat on the hips, may be desirable; but there can be
n the protuberance of the tuberosities of the bone. A full hip
at scarcely a protuberant one.

kspeare have been described. Those of the Jull D were not less
earing to grow out of the top of his spine, instead of being a con-
; and the upper part of the tail forming an arch, which rose some
level of the back. This, viewing him as a picture, has a good
a very bad one for the grazier, as tending to hide the fatness of
in many other points, the son and the sire are as dissimilar as
inity.

s an anecdote respecting the peculiar length of quarters, and
ese cattle. 'On my observing to Mr. Princep the remarkable
said he was one day showing them to a gentleman, who, as the
st bull out of the house, exclaimed in astonishment, "When will
—Parkinson on Live Stock, vol. i. p. 154.

more owing to the gauntness of the carcase, than to the actual

the long-horns have been in error, when they have considered this
scussion of this point, however, will be advantageously deferred
d the anatomy and proper form of oxen.

beast always appears to be larger than a dark-brown, or black one
re, perhaps it is, that the lighter ones are preferred. There is a
n in their favour; but, otherwise, if colour has anything to do
nimal, we should give the preference to a dark-coloured one, as
hood, and generally with equal mellowness of skin.

ebster's cows, the parents of the Canley breed, were red; and so
f Mr. Fowler's.

of mystery was thrown over most of his proceedings, which not friend Mr. Marshall was disposed to raise. The principle on which he seemed to act, breeding so completely 'in and in,' was a novel one and a successful one. Some of the cattle to which we have referred are very extraordinary illustrations, not only of the harmlessness, but of the manifest advantage of such a system; but he had a large stock of cattle to work; and no one knew his occasional deviations from this system, or his skilful interpositions of remoter affinities, when he saw or apprehended danger.

The truth of the matter is, that the master spirits of that day soon disappeared, than the character of this breed began imperceptibly to change. It had acquired a delicacy of constitution, inconsistent with common management and keep; and it began slowly, but undoubtedly to deteriorate. Many of them had been bred to that degree of refinement that the propagation of the species was not always certain.

In addition to this, a rival,—a more powerful rival, appeared in the field. The improved short-horns began to occupy the banks of the river. They presented equal aptitude to fatten, and greater bulk and earlier maturity.

Westmoreland was the native land of the long-horns. Webb brought thence the father of the Canley stock; and Bakewell had the father of his breed there: but even in Westmoreland the short-horn appeared; they spread; they established themselves; they, in a manner, superseded the long-horns. They found their way to southern districts, mingled with the native breeds; a cross from them generally brought an increase of milk, aptitude to fatten, and early maturity. It was so that a frequent recourse to the short-horn was generally necessary to retain these advantages, but these advantages were bestowed in such a manner that they might be retained, except in a few districts, and for some particular purposes. Thus they gradually established themselves every where where were the grazing cattle of the large farmer and the gentleman, and every other variety of them occupied the dairy. The benefits conferred by the improved long-horns remained, but the breed itself gradually diminished. In some places it almost disappeared; and at the present moment, as in Leicestershire, the short-horns are fast driving the long-horns from the field. The reader may scarcely give credit to the assertion, but it is strictly true, that at the present moment (1833) there is not a single improved Leicester on the Dishley farm, and scarcely a half-dozen in the neighbourhood. There are not a dozen pure Leicesters within a circuit of a dozen miles of Dishley. It would seem as if some strange convulsion of nature

short-horns are establishing themselves, and the long-horns of Scotch cattle are grazed in Westmoreland. They come to the Lough Hill fair in the beginning of September; wintered in the straw-yard; sent to the commons in the spring, most being put upon the best grounds, they are ready for the south, or even to be killed for the Westmoreland con-

There are many Scotch, and also many of the native (Cravens,) with which neither the heavier improved short-horns interfere.

In the cultivated parts of the country, the old and large long-horns are excellent feeders; they grow to a very con-

LANCASHIRE.

In the north part of this, the native county of the long-horns, that breed is seen in a pure state. In the neighbourhood of large farms the milch cow is chiefly kept; for where the quantity of milk produced can vie with the Holderness*. Where butter is made, between the long and the short-horn is preferred. These are more hardy, less liable to illness, and the milk of the short-horn is little diminished in quantity, while it acquires the peculiar richness of that which is given by the long-horn.

In the south, the native breed is rarely seen; but at the annual Manchester Agricultural Society, the short-horns bear prizes, and in the centre of the county, although a prize is yearly offered for the best long-horn bull, not one has

been seen. The quantity of milk, yielded by a good Holderness cow in the neighbourhood of Manchester is about nine quarts per day. A good long-horn cow will yield about eight quarts. Mr. Stevenson, who published a Survey of Lancashire, in 1814, gives the expenses and returns of a milk-farm, in the neighbourhood of Manchester, which he refers was under the management of Mr. Peter M'Niven; and the result is as follows.

£.		£.
520	15 acres of oats at 15 $\frac{1}{2}$ l.	225
84	20 ditto at 20 $\frac{1}{2}$ l.	400
234	40 cows' milk at 12 $\frac{1}{2}$ l.	480
267		
1105		1105

we have stated, among the larger farmers, and the Yorkshire cows in the milk dairies, there cannot be said to be any prevailing breed established in the southern part of Lancashire.

Mr. Bunnell, V. S. of Liverpool, assures us that in the neighbourhood of that town, very few cattle are *bred* for the purpose of grazing, and those which are *fed* are chiefly confined to gentlemen's parks, and principally Scotch Highland bullocks. To the same gentleman I am indebted for the following account of the supply of the Liverpool market.

WEEKLY AVERAGE.

' 600 Irish beasts, average about	6 cwt. of 120 lbs.
' 140 English do. do.	6½ do.
' 60 Scotch do. do.	5½ do.

' Of the cattle from Ireland, about twenty are short-horns; sixty long-horn Leicester breed, and the remainder of the old Irish breed, with the exception of a few Devons and Ayrshires.

' Of the English cattle, about one-third are short-horns; one-third Cumberland long-horns; and one-third Herefordshire and other breeds.

' Of the Scotch cattle, about one-eighth are short-horns, and the remainder Galloways and Highlanders, of various descriptions.'

Towards the middle of Lancashire, we find some zealous breeders of the short-horns. Mr. Almond, of Standish, is foremost among them, and his cattle bear off the bell, even among the most successful cultivators of this breed. The Earl of Wilton is a frequent competitor at the meetings of the Manchester society. In 1830, he exhibited the best yearling short-horn bull, and some very fine specimens of the breed fattening after milking.

We meet with more of the long-horns, but they are principally of an inferior sort. Mr. Harrison, V. S. at Lancaster, thus expresses his opinion: ' Since the rage for short-horned cattle has commenced, and still continues in this neighbourhood, the breed of the native long-horn has immensely declined, and it is now a very difficult point to find a good specimen of long-horns; there not being more than half a dozen breeders of the breed in a district of 20 miles. There is, however, Mr. Allen Kirk's stock of long-horns at Middleton, which for purity of breed cannot be excelled.

' The cattle in this neighbourhood are mostly cross-bred—long-horn and short-horn, short-horn and Scot; but the short-horn, with its various crosses, is that which has encroached most upon the long-horn, and is to be rapidly superseding that breed.

' That the long-horn breed has deteriorated of late years is not to be wondered at, when a half-bred cow, or any other cross, will fetch a

ving to the ilium not presenting so broad and horizontal
e short-horn—many of them are also roughish about
e bones in the centre of the hip (the sacral bones).
ally rounder and larger, consequently affording a better
n the short-horn: the tail is thicker, and the bones of
and heavier. The long-horn weighs heavier in propor-
measure than the short-horn, and his hide is heavier,
ndle so loose and free. The colour varies; but a red
or red legs, and a white streak down the back, is the
Their average weight when fattened is eight score per
value is not so great either for grazing or milking by
per head.'

ed this accurate account of the best of the present long-
der may be enabled to compare them with the old Bake-
dy described, p. 195. Crosses of all descriptions abound
ncashire; one between the long-horn and the Holderness
ng the most frequent and the most valuable; and said
larly, not only to retain but to possess in an increased
qualities of both. They suit all parts of the county.
hardy nature than the short-horn, and they gain by the
of more milk and butter; they are also better graziers
s, fattening in less time, and arriving at maturity much
finer in the head and neck, the ribs are longer, and
their cylindrical form. They are wider also across the
s. They handle more freely, attain a greater weight
d the hide is not so heavy. The prevailing colour of
d white.

is excellent, but the produce is uncertain; and in the
the third or fourth generation are long-horns again, but
qualities of the original stock. They are of diminished
l milkers, and will not graze kindly; in addition to
uch uncertainty whether the cows will hold to the bull.
the cows among some of these half-breds fail of being

fully sensible of these disadvantages, have wished once
he pure long-horn breed, but there is more difficulty in
ng-horn bulls than could be conceived to be possible in
iginal district of the long-horns: they have, therefore,
have frequent recourse to the short-horn bull, or their
ome almost worthless; yet the cottager, without any
nd, often has a half-horn cow that is invaluable for his
rrison, although, with natural partiality, he is unwilling

of short-horn cattle, Mr. Allen Kirk of Middleton, and Mr. Col
Heaton, are almost the only patrons of the long-horns in this distri
Some good cheese is made in this district. The dairy-farmers
prefer the long-horns; or, if they permit any admixture of sho
blood, they are anxious that that of the old Lancashires shall de
prevail. These cattle, when their milk fails, and they are in tolera
condition, average from thirty-six to forty stones, imperial weight.
summer food is the native grass; their winter food, meadow ha
cut potatoes (those which are too small for household purpose
oatmeal or bran, or cut straw; but they are suffered to stand out
field a great part of the day, although there may be little or no gr
them to eat. The calves are reared only in the spring, and suck
the hand until they are seven or eight weeks old, when they are
to grass, but still have a little hay for some time, and also hay-tea, o
other preparation in the evening.

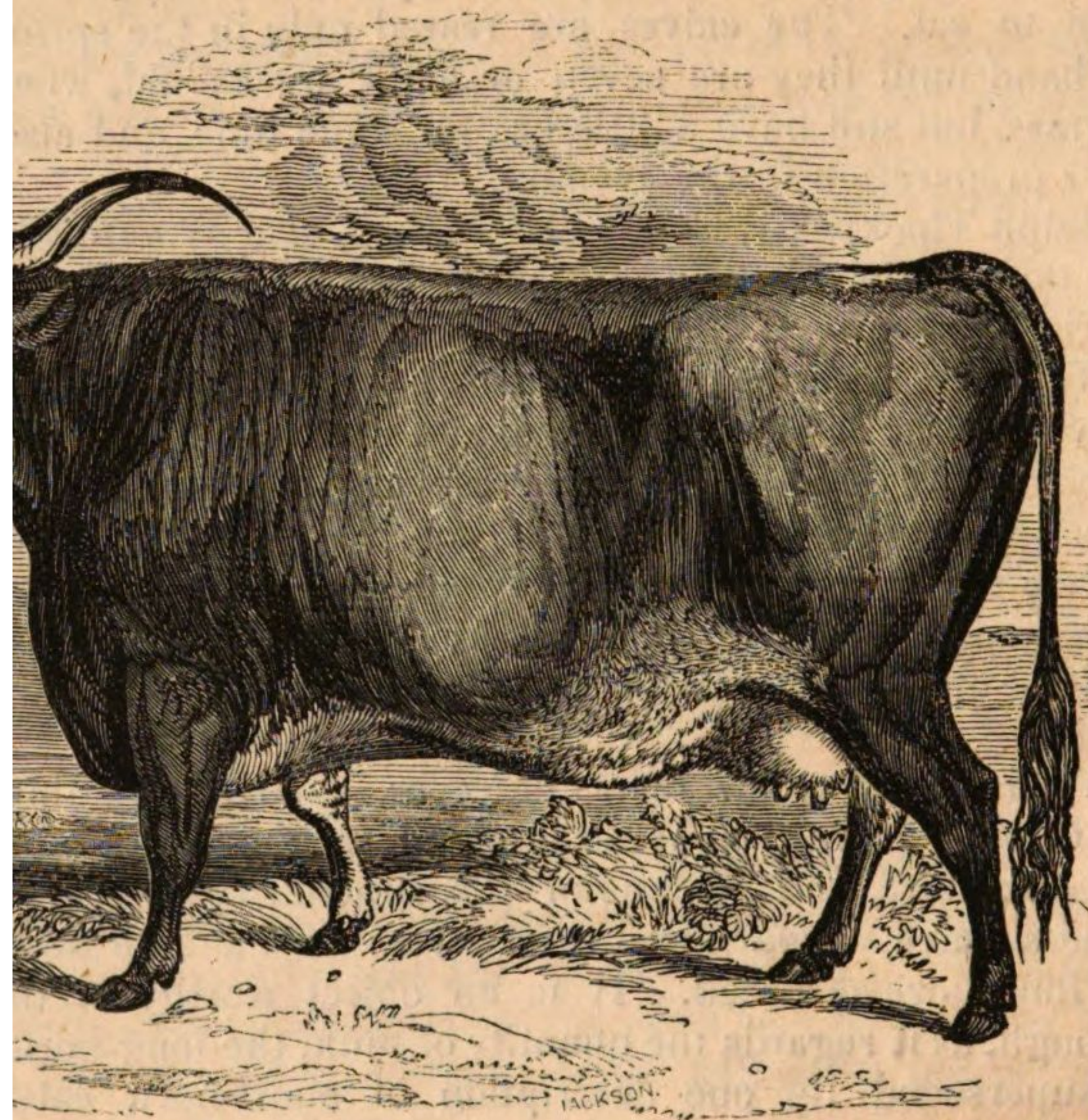
Ralph Thicknesse, Esq. of Beech-hall, near Wigan, will please to
our thanks for his polite attention to us respecting the cattle
district.

We have described the north of Lancashire as being peculia
native district of the long-horns, and there, although a few short an
horns are occasionally seen, these are the prevailing, or only
breed: yet even there they are not what they once were, and
atively few traces of the Bakewellian improvement remain; nor
cattle generally appear to be more valuable than when he sent
borders of Westmoreland for the fathers of the improved Le
breed

Within the last few years, however, excited probably by the im
ment going forward in Westmoreland, in the north, and in all the
of Lancashire, and jealous of the superiority of the short-horns,
farmers have endeavoured, and with considerable success, to re
the long-horned breed. It is an object worthy of their attentio
although, as it regards the quantity of milk, the long-horns must ult
be superseded by one description of short-horn cattle, and in
maturity by another, yet it is too valuable a breed to be lost, or
much deteriorated.

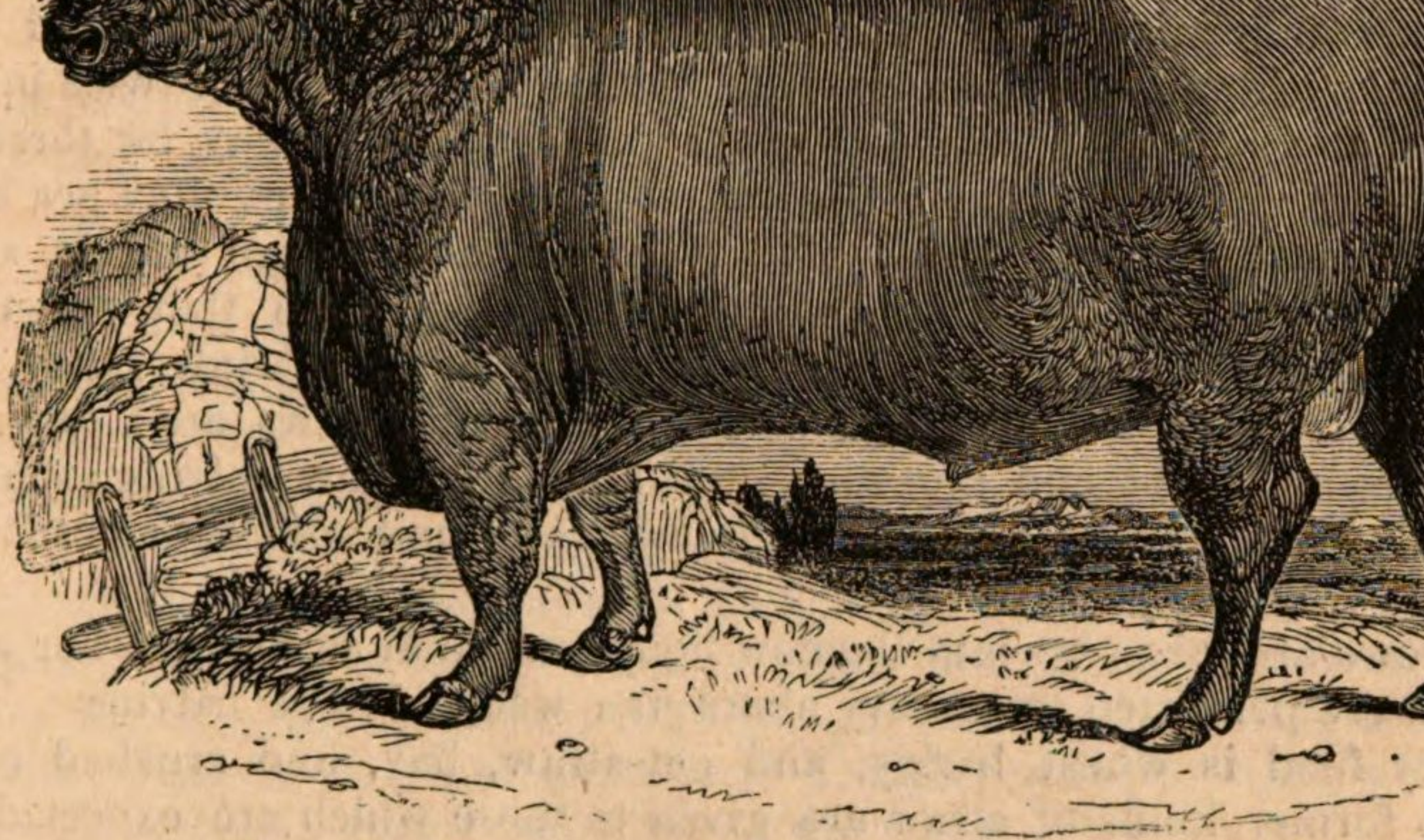
There are many large dairy-farms in this part of the country; th
horned cow is usually kept. The average produce is from $2\frac{1}{2}$ to 3
cheese from each cow, in a strict cheese-dairy farm, the family bei
provided with milk and a little butter.

breed, they were very useful animals, and especially in
county, the cheese of which has long been admired.
them their peculiar character, and especially their sin-
ow impossible to determine. The head was frequently
e chops and neck foul, the bone too large, the hide heavy,
even the bag was often overgrown and covered with
ce very objectionable to the dairyman; they were little
on flesh and fat, for when some of the improved bred
l for the butcher, the beasts of the old sort would be
in and bone; yet they were excellent dairy cows.



[Derby Cow.]

is a faithful portrait of one of the best of them. The
er characteristic.
s first made to cross the Derby with the improved short-
cross answered admirably; but, as we have said, when
ashire, the progeny of this cross was clumsily shaped,
ct inferior to its progenitors.



[*Derby Bull.*]

This cut gives a faithful representation of the old Derby bull breed, however, has gradually died away, and it is comparatively that a pure Derby can now be met with. The short-horns have possession of this portion of the territory of the long-horns and prejudice against them as to their want of hardiness, and the quality of their milk, has vanished; and there are few dairy farmers now, and in the neighbourhood of Derby, that have any long-horns in the country, and yet it is confidently asserted that some cows of the ancient stock yielded as much as seventeen pounds of butter in the space of seven weeks.

CHESHIRE.

THE short-horn breed has penetrated into this dairy-county, and has obtained a variable advantage. Amidst the dense population of some of the rural districts the short-horn has materially increased the quantity of milk, but it is more than doubtful whether he has not injured rather than benefited the cheese dairy.

The Cheshire was chiefly a long-horned breed, of very mingled blood, but which by degrees accommodated itself to the climate and soil. It contained in it a portion of the blood of the old Lancashire, the Shropshire, the Staffordshire, and the new Leicester; and some slight degree dashed with the Irish long-horn, the Welsh and middle-horn, and the Yorkshire short-horn, and from a strange mingling of the whole proceeded the Cheshire cow. She was a small, gaunt, and ill-shaped animal; yet she possessed a large thick

afterwards kept on warm green whey, scalded whey mixed, or hard fleetings. Some give oatmeal gruel and a little skimmed-milk mixed. This is given twice in the day when the cows are turned to grass, and once in the day for three or four weeks. During the first and second winters they are kept in an open shed, well foddered, and turned out as soon as the weather is ready. In the summer following, when they are two years old, they are put to the bull; and during the third winter, they are, like the cows, tied up at the same time that the cows are: they are milked at eight and morning, until a month before calving; hay is given as long as they continue housed, and sometimes crushed oats are given early.

The cows are taken up into the cow-houses as soon as the weather gets cold, and are permitted to go dry about ten weeks before calving. The cows are given wheat, barley, and oat-straw, hay, and crushed oats. Different kinds of straw are given to those which are expected to calve early on account of a supposed tendency to dry the milk up sooner; sometimes hay, is given to those that are not expected to calve in the spring; hay is given to all of them three or four weeks before they are expected to calve. From the time they have calved until they are turned out to grass, crushed oats are given twice in the day, and three-fourths of a bushel per week. The cows are turned out to a pasture-field near the building, from nine or ten in the morning to three or four in the afternoon, but have no fodder in the house. When they show a desire of being taken up again, they are let in, and housed, and this is better than suffering them to stand in a field without shelter. The turning the cows out to grass in good condition is a matter much attended to, in order that they may be in good condition when turned out to grass; for if a cow is not in good condition when turned out to grass, and has been too much dried with barley-straw, it is a long time before she can give full milk.

The use of green crops and particularly of turnips, and the feeding for dairy cows, has materially altered the old management. The grand object with the dairy farmer is to increase the quantity of his milk, and to continue it as long as possible. This is more effectually done than by giving green or succulent crops. Turnips are more abundant, and it may be continued a month longer than green-cabbage and the Swedish turnips are the kinds of crops cultivated in Cheshire. The former is given when the weather is warm; the latter are used in the winter, when the cows are housed on straw; and as little cheese is then made, the flavour communicated to the milk is not of so much consequence.

This county, fifty years ago, contained few cattle except long-horns. It has already been stated, in page 189, that the females, from whom ultimately sprung the improved Leicester breed, were from Nottinghamshire. The earliest breed of which we have mention came from Drakelow, on the borders of the Trent. The cows which Mr. Webster brought to Canley were from the same farm; and Mr. Bakewell's two heifer-mothers of all his stock, were purchased from Mr. Webster.

The better kinds of cattle, however, were confined to the banks of the Trent. In the clay district, the beasts were poor and coarse; and in the forest, few that were valuable were bred. The short-horns have here completely superseded the old cattle. They first began to appear in the vale of Belvoir, and thence spread through the lime and coal districts, and now, either in the form of the pure Yorkshire cow, or many a valuable and mingled breed, they occupy nearly the whole of the county.

LEICESTER.

In this county, in which the long-horns had been brought to the highest perfection, it would be imagined that the latest and most

* Fuller, in his 'Worthies,' p. 68, thus speaks of the Cheshire cheese. 'This doth afford the best cheese for quantity and quality, and yet their cows are not, as in other shires, housed in the winter; so that it may seem strange that the hardiest kine do produce the tenderest cheese. Some essayed in vain to make the like in other places, from thence they fetched both their kine and dairy-maids: it seems they should have fetched their ground too, wherein is surely some occult excellency in this kind, or good cheese will not be made. I hear not the like commendation of the butter of this county, and perchance these two commodities are like stars of a different horizon, that the elevation of the one to eminency is the depression of the other.'

Dr. Leigh, in his 'Natural History of Cheshire,' and Dr. Campbell, in his 'Forest Survey,' attribute the peculiar flavour of the Cheshire cheese to the abundance of saline particles in the soil of this county, and the latter says that where the brine springs abound, the cheese is esteemed to be of the most superior quality; but this notion has exploded.

The places and districts most celebrated for making the prime cheese are—the neighbourhood of Nantwich, the parish of Over, the greater part of the banks of the Trent, Weaver, and several farms near Congleton and Middlewich.

† In Lyme Park is a herd of upwards of twenty wild cattle, of the same sort as those at Chillingham, chiefly white with red ears. They have been in the park beyond the memory of any one now living; and as there is no account of when they were first there, the tradition is that they are indigenous. In hot weather, these cattle graze on the hills and high grounds; and in winter in the woody parts of the park. In severe weather they are fed with hay, for which, before the hollies with which the park abounded were cut down, holly-branches were substituted. Two of the cows are generally shot yearly for beef.—Lyson's *Magna Britannica*, Chester, p. 729.

ed away. Although, however, the improved Leicester disappeared, it was from no fault of theirs,—Bakewell's improved breed, the coarser parts of the animal were the more valuable were increased; but they gradually superior claims of a race of cattle at that time scarcely

of the long-horns do linger, the *improved* Leicesters are the old breed of the country retained or returned. For early maturity, the long-horns must yield to the Durhams; their adaptation for particular localities, and the peculiar smaller quantity of milk, in the production of certain produce, that enable them anywhere to maintain the country remain in Cheshire, in despite of the somewhat injudicious to displace them, and the stock of few of the dairy farms neighbouring counties. About Hinchley, Bosworth, Appestown, a few of the farms are supplied by the long-horns, mixed breed between the Lancashire and the Durham. Tons of cheese are made in Leicester every year, and it is tons are annually sent down the Trent from this and the counties *.

RUTLANDSHIRE.

county could never make pretensions to a peculiar breed. Always the principal object here, and the Irish and small st in request. Marshall, in his 'Agriculture of the Midland that in his time, the Irish had not long been known in Rutland that they were then bought in preference to the Welsh, and large Scotch, which had been previously grazed. Her's grass they were usually sent to London, stall-feeding practised; and occasionally hay was given in the fields to eat of them, to keep them until after Christmas. Many of

Stilton cheese was first made at Wimondham, in the Melton quarter. Mr. Marshall gives the following account of it:—'Mr. Paulet, who Wimondham, a relation of Cooper Thornhill, who formerly kept the Bell at Wymondham, on the great north road from London to Edinburgh, furnished cream-cheese, which, being of a singularly fine quality, was coveted and through the assistance of Mr. P., his customers were gratified at half a crown a pound. In what country this cheese was manufactured known, and hence it obtained the name of Stilton cheese. At length being it was discovered, and the art of producing it learned by other in the neighbourhood. Dalby first took the lead, but it soon made its way to Wymondham in that quarter of Leicestershire, as well as in the neighbouring Lincolnshire. Many tons of it are made every year.'

the county has disappeared, and a great many pure short-horns found, or a cross between them and the Derbyshire. The cross the two is gradually disappearing, and the short-horns are taking possession of the district.

CAMBRIDGESHIRE.

The native breed of this county was a long-horn one; but short-horns prevail in every dairy where the land is tolerably good. On poorer land there is a smaller half-horn breed, which yields better milk than its appearance would indicate, but is slow and unable to fatten. The Rev. Mr. Gooch, in his 'Survey of Cambridgeshire,' tells us that Cambridgeshire having been a dairy country from time immemorial, among other good milking stock attempted to be introduced was the polled cattle, from the neighbouring county of Suffolk. Mr. Gooch purchased a dairy of them, but they began speedily to decline, and he re-sold them to their former owner, who took them back to their original situation, in which they were speedily restored to their original health.

It is true that the Suffolks have never extensively established themselves in Cambridgeshire; but we know some dairies of the county which answer exceedingly well.

Few parts of England produce better butter than Cambridgeshire. It is curiously rolled up in pieces of more than a foot in length, and four inches in diameter, for the convenience of the collegians, to whom it is sent in slices, called pats. A great deal of butter is likewise sent to the London market, but there is not much cheese made, except at St. Ives and Cottenham. A great many bullocks are grazed, consisting chiefly of country stock, the Norfolks and Suffolks, and the Galloway Scotch. The most profitable method of grazing is to buy them about autumn, and keep them at the succeeding autumn; keeping them on hay and grass in winter, and finishing them off on grass. On the grazing grounds in the fens, many Devon cattle are now prepared for the markets.

NORTHAMPTONSHIRE.

Northamptonshire is not a breeding district, but cattle are brought from other districts and purchased for the London market, and they consist of a great variety of breeds. An Agricultural Society has been established in this county, and is conducted with much spirit and consequence. In consequence of this, the short-horns are now diligently cultivated by intelligent farmers*.

* Marshall, in his 'Agriculture of the Midland Counties,' and quoting from Mr. Marshall's Survey of Northamptonshire, says, 'Very few cattle are reared in the county.'

duce of those districts, might lead to some useful consequence of so generally prevalent and fatal a disease.

BEDFORDSHIRE.

, also, the long-horns, the old cattle of the county, have reared. There is not a single farmer who breeds them. Some half-horn cattle are to be found among the and the cow of the cottager is here, as in so many other uce of the old long-horn and the Yorkshire, crossed in y, and retaining the milking properties of the one, and he other, and therefore fitted to become the poor man's

tion, there is no distinguishing breed belonging to the gentlemen have the Devons—more prefer the Herefords, the short-horns; the short-horns, indeed, are here, as superseding the rest.

ontributes much to the supply of the dairy cattle of the y heifers are brought from the north, and having been e in this county, and become heavy in calf, are sent tropolis. By some farmers, and in this respect we ima-er-reaching themselves, they are detained longer; they e or two years, and then despatched to the metropolis.

en field (lordships excepted), and these are so crossed and mixed her counties, which are often improperly chosen, and so stinted in or them comparatively of little value.

s where attention is paid to the breed of cattle on the inclosed farms, kind most preferred, and are far superior to the original breed of ze and shape, and extraordinary disposition to fatten.

s in the south-west part of the county, however, prefer the *short* from which county they are principally supplied; and as they never sell them when a few days old to a set of men who make a trade he markets of Buckingham and other places, where they are pur-ers from Essex, to be fatted for veal for the London markets.

ay, the farmer begins to purchase bullocks, and the breeds of Shrop-ire are preferred. In the course of the summer, some Scotch and ght in—he begins selling off in September, and by the beginning e are disposed of.

ansporting the calves used to be both absurd and cruel. The jobber nd to take to complete his purchases; and after that, he had to before he reached his abode or place of sale in Essex. Sometimes lves were put into one cart, and laid on their backs in the straw, gether; and if the journey occupied seven or eight days, they had at but wheat-flour and gin mixed together, well known in that line e of gin-ball, and thus the calves were kept in a state of stupidity or e whole of the time.'

abandoned, until, at his decease in 1802, he was balancing between the North Devons and the Herefords.

His brother, the present Duke of Bedford, (1833,) to whom indebted for permission to view every part of his farm, and valuable information besides, gave the preference to the Herefords, with the exception of a few Ayrshire and Yorkshire cows, which provide milk for the calves and for the house, and always a succession of West Highlanders to graze, constitute the whole of his stock*. When he abandoned the North Devons, he still considered them to be a very admirable breed of cattle, and only inferior to the Herefords, as not so well adapted to the soil of Woburn quite so well. A few North Devons are still kept for farm work, but they are not the true Bedford breed, but of a somewhat heavier, but still more useful variety, most prevalent on the borders of Somersetshire.

The pasture at Woburn is somewhat inferior to that of Herefordshire generally, and the cattle selected, and having much in them of the blood of Messrs. Tulley's, and Tomkin's, and Price's stock, are not so good as those which are principally met with on their native soil; and are not the worse for this. They lose much of the heaviness and coarseness of the shoulder which has sometimes been objected to in the Herefords, and they retain all the length of quarter, and much of the wide roundness of hip, and fullness of thigh, which have been esteemed the peculiar excellencies of the Herefords. A few of them might, with their fore-quarters be mistaken for Devonshires; but with a broader chine and weight behind which the Devons have rarely attained, it is little that is unusual in the feeding of these beasts. The calf is suckled by the mother for about a week, and is then taken away, and fed at first with milk from the dairy, and, afterwards, with skim-milk. It then runs on the ordinary pastures until two years old, when it is put on better pastures, and passes the third summer at grass, is stall-fed in the winter, and is sent to market at three years of age, and will attain the average weight of about ninety-five stones. His Grace has often exhibited cattle at the various fairs of a far superior weight.

His present stock consists of from thirty to forty cows. The bulls are fattened; the best of the females are retained for breeding; the other beasts being bought in in the summer and autumn, seventy

* No polled cattle are now grazed on the Woburn estate. After many years of experience, some of them on a large scale, the Duke of Bedford gives a decided preference to the horned breeds. When the polled cattle were grazed there, the Galloways have given way to the Angus, and Mr. Todd expressed to us his decided opinion, that they were faster than the Galloways, and afforded meat equally as good.

the 29th, at 16*l.* 5*s.* each, and four polled Galloway
 eight December 22d, 1818, at 11*l.* 11*s.* each, in store
 fresher than the above, having been wintered on the
 se bad hay, were put to grass in the same field, and
 tober 21st, being a period of five months.

	Ton.	Cwt.	Qrs.
es weighed on May 20	1	12	0
1st they weighed	1	19	2
ight in the five months	0	7	2
ghed in May	1	10	1
ber	1	18	2
d	0	8	1
an excess of weight gained above that of the } es of	0	0	3

£.	£.	s.	£.	s.
at 84	Cost 65	0	Gained by grazing	19 0
. 74	Cost 46	4	Gained	27 16

our of the Scots 8 16

ever, is to be deducted the value of the refuse hay

s and twenty Scots were bought in in October, 1822,

t were fed in a warm straw-yard upon straw alone, but
 out upon the moor.

a meadow, having hay twice every day until Christmas.
 s lay in the farm-yard, and had oat-straw and hay, cut

They were then grazed in different fields, equal pro-
 rt being put into the same field.

in the warm straw-yard with straw only, were ready as
 although the others had an allowance of hay during

h were sold at different times ; March 24th, 1824,

. The Scots were ready first, and disposed of before

2*s.* 10*d.* each, amounting to 122*l.* 5*s.* 4*d.*; they sold for £. s. d.
 y grazing 113 13 2

6*s.* 6*d.* each, amounting to 117*l.* 4*s.*, and they sold for
 ady, on the average, until between six and seven weeks
 imating their keep at 3*s.* 6*d.* per week each, amounting
 s being subtracted from 230*l.*, there will remain as the
 for them 211*l.* 5*s.* 6*d.* Gain 94 1 6

a favour of the Scots £19 11 8

the whole should be fed alike, both at grass, and in the stall.

Twenty Scots and twenty Devons were again bought in and sold at different times, but always an equal number of each time, the last sale taking place in March.

The twenty Devons cost 189*l.* 9*s.*; they sold for 370*l.* 17*s.* 10*d.*; leaving for feeding

The twenty Scots cost 212*l.* 3*s.*; they sold for 374*l.* 5*s.* 1½*d.*; leaving for feeding

Balance in favour of the Devons

Two experiments, on the fattening properties of different food, will not be unacceptable to our readers.

Six Scots, previously grazed together in the same field, were and stall-fed on the 6th of January, 1823, and the feeding was until the 14th of April. They were divided into pairs.

To each of one and two were given daily, one bushel of manure two quarts of bean and barley flour mixed, and as much hay as they would eat.

Three and four had one bushel of Swedes each, with the barley flour, and hay.

Five and six had three pecks and a half of potatoes, with the barley flour, and potatoes

	£.	s.	d.	
One and two consumed 18 cwt. 1 qr. of hay at 3 <i>l.</i> , amounting to 2 <i>l.</i> 14 <i>s.</i> 9 <i>d.</i> ; 1½ qr. of flour at 3 <i>s.</i> 1 <i>l.</i> 16 <i>s.</i> ; and 196 bushels of mangel-wurzel at 9 <i>d.</i> 7 <i>l.</i> 7 <i>s.</i> amounting to	11	17	9	
They gained 3 cwt. 1 qr. 7 lb. at 5 <i>s.</i> 4 <i>d.</i> per stone at that time	12	7	4	Gained by feeding
Three and four consumed 20 cwt. 2 qrs. of hay at 3 <i>l.</i> , 3 <i>l.</i> 6 <i>s.</i> ; bean flour 1 <i>l.</i> 16 <i>s.</i> ; and 196 bushels of Swedes at 9 <i>d.</i> , 7 <i>l.</i> 7 <i>s.</i> , amounting to	12	9	0	
They gained 3 cwt. 2 qrs. 21 lb. at 5 <i>s.</i> 4 <i>d.</i>	13	15	4	Gained by feeding
Five and six consumed 23 cwt. of hay at 3 <i>l.</i> , 3 <i>l.</i> 9 <i>s.</i> ; bean flour 1 <i>l.</i> 16 <i>s.</i> ; 78 bushels of potatoes at 1 <i>s.</i> 1 <i>d.</i> , 4 <i>l.</i> 4 <i>s.</i> 6 <i>d.</i>	9	9	0	
They gained 2 cwt. 3 qrs. 7 lb. at 5 <i>s.</i> 4 <i>d.</i>	10	0	0	Gained by feeding

We will condense our account of the second experiment. Two Scots were fed on English linseed cakes; two Devons on unboiled linseed, two others on boiled linseed, and another pair of Devons on oil-cakes, all of them having as much hay and chaff as they could eat. It was of no concern in every case: the value of the manure was not equal to the difference of the cost and the selling prices, and strange as it may seem, the greatest loss was sustained when the beasts were fed on oil-

says, that, with the exception of Pevensey Level and
re is no land in the kingdom better adapted for
e of Aylesbury. Its amazing fertility soon makes a
the appearance of every beast, and causes them to
dinary size—these are proofs of the qualities of the
e grazed about ten months, and do not often require
han a supply of hay in the field during winter.

excellent butter are sent from the Vale of Aylesbury
The butter merchants contract for it at different prices,
son of the year; and the carrier contracts for the
certain charge for each dozen pounds, finding cloths,
ches it from the dairyman and delivers it to the

BERKSHIRE.

and penetrated as far south as this county, and at the
ury fully occupied it. They bore much resemblance
rdshire and Warwickshire. The different breeds of
have now, however, completely superseded them. A
now rarely seen, and even the half-horns are disap-
ins, of Abingdon, and Mr. Webb, of Oakingham,
tinguished by their early introduction of this breed.
cts of Berkshire, many Welsh and Scotch cattle are
cattle occupy the more fertile pastures.

antity of butter is made on the borders of Oxford-
he Vale of the White-horn is celebrated for its cheese.
d in London, under the name of single Gloucester
d in the press into a variety of curious shapes. Mr.
hat ' they sell more dearly than other cheese, partly
hape, and partly because the best cheese is supposed

These pine-apple cheeses are made without any
hine: they are suspended in nets which gives them
ons which they present. From the wharf of Barcot,
y three thousand tons of cheese are sent down the
itan consumption, partly collected from neighbouring
nties, but principally from Berkshire.

f experiments on the comparative fattening qualities of the
ttle, we will not now refer. One, although not then assigned to
esent Duke of Bedford, was detailed at page 34 of this work,
es with referring to that. The patrons of the short-horns, how-
it as altogether satisfactory in its details.

Moulden, informs us, that in the neighbourhood of Winchester Norman is often crossed with the Hereford; the Norman is not as a milker, while she is improved in size and disposition to milk. About Southampton, the Alderney is the prevalent breed. There are many facilities for obtaining her from the contiguous islands of Guernsey and Jersey. In this part of the county, the Alderney has been crossed with the forest breed, and also with the Suffolk. The forester has improved the Norman has deteriorated in consequence of the first cross, and the second has been attended with doubtful success. Next to the Alderney the Suffolks are most in favour on the coast of Hampshire.

Mr. Gawler, in his 'Report of a North Hampshire Farm,' (1st Series, No. VII. p. 15,) states that 'the stock in general best adapted to this soil are the Alderney, and the smaller race of Norman cows. Devonshire and larger breeds require richer pasture; and although they may be kept in condition, the milk they give is by no means in proportion to the bulk of food they consume. Mr. Gawler's dairy stock was in the proportion of one cow of the Devonshire breed to three of the Alderney or Norman, and the milk was mixed on the presumption that, being diluted, it produced better butter, and a larger quantity of it.'

Sir Richard Simeon has favoured us with a description of the cattle of the Isle of Wight. They are a small mixed kind without any peculiarities which would mark them as distinct breeds. Scarcely any oxen are bred from them: cow-calves are saved for the purpose of milking up the dairy; invariably from the best milkers, and not with a view to their aptitude to fatten.

The dairy stock has been occasionally mixed with the Guernsey and Alderney cattle, and with success so far as the quantity and quality of the milk go. Some attempts have been made to introduce the short-horn, but in some instances the cattle of the island have been improved in appearance; but, looking to the general capabilities of the island for the maintenance of large stock, and fitting them for the purpose of the dairy, it may be doubtful whether the smaller and rougher kind of cattle would not be a safer description of stock, and likely to produce a better return to the farmer. The Alderney is a favourite breed—a cross between the Devon and Guernsey. Devon has produced some very good cows here, well adapted for the dairy, and not unprofitable for the butcher.

The value of the Isle of Wight cattle depends almost exclusively on their being good milkers: for the purposes of the butcher, many of them are of little value, on account of the generally received opinion that a cow which has an aptitude to fatten is a bad milker. The farmer therefore breeds from a cow which has good points for grazing.

station amounts to about 500 annually, besides which 100 west country calves brought into the island a little. These are partly taken into the dairies and partly. One of the finest dairies in the island belongs to Mr. [unclear]. His cows are of a larger sort than are generally crossed with the Durham. He has devoted a great deal of land to agricultural pursuits. He first introduced mangels and turnips into the Isle of Wight.

much used in husbandry labour; and the few oxen on the south side of the Downs are generally brought from England. They are used in field labour, but not on the notion that their feet would suffer, and that they are not so good as horses for this kind of work. They are found to work as fast and as well as horses, and are kept at much

WILTSHIRE.

Wiltshire, but particularly the northern division of it and the counties of Gloucestershire and Berkshire, was, at the eighteenth century, chiefly occupied by the long-horns.* According to Mr. Baden, of Day-house, (to whom we are indebted for information respecting this district,) as "a fine, healthy breed of dairy and for feeding, and with immense spreading horns, bending towards the mouth, but they were not so good for the grazier or butcher, because their flesh was sometimes found to average from thirty-six to forty-eight scores." Mr. Baden has increased them to fifty scores, and a relative of his has carried them to sixty scores, confining them to grass and hay alone. Many persons used to object to these long-horned cattle. They were too heavy—they injuriously poached a land, the great objection, that it was already too cold and wet,—they did not

say what was the original kind of cow kept in this district, probably the Wiltshire cow, a sort now almost lost, or, perhaps, as is the case in the north of all sorts: but the universal rage for upwards of twenty years for long-horns, or, as they are called, the "North country cows," and nine-tenths of the dairies in this district are entirely of that kind. The general introduction of that sort are the nearness of their country breeders, but perhaps the real reason is that "pride of blood" like "the pride of sheep and horses," in south Wiltshire, has led to an emulation in beauty and size more than in usefulness. In pride the breeders have not been wanting in using every artifice to

rapidly than the other varieties of the old long-horns. A cross with the short-horns remains, and are excellent dairy cattle. They daily from four to five gallons of milk, during the height of the season. They are an improved breed, for they retain the hardihood of the long-horns and good quality of the milk, with the early maturity and quantity of milk of the short-horn.

This cross-breed, however, must be carefully watched, for it is very apt to degenerate. Frequent recurrence must be had to the pure short-horn bull, and the bull must often be changed. There are, however, in various parts of North Wilts, and particularly in the hands of the farmers, as various and inexplicable crosses as are to be met with in any part of the kingdom, and some of them exceedingly useful beasts. It is contrived that the cows shall calve from Christmas to Lady-day, in the warm, early soil, but not until three weeks later on a backward, cold season.

Mr. Baden recommends that warm water should be given to the cows after calving, especially if she has not cleansed, for cold water may retard or prevent the expulsion of the after-birth, and particularly draw all the milk from the teats for the first twelve hours.

If the calf is strong and healthy, the best time for weaning is at the expiration of the third week; it should be put into a cow-house, and served from a pail: it will drink readily after being kept one day from the mother. One quart of skimmed milk, added to one warm frothy meal is deemed a sufficient meal, and good hay should be placed before them for they will eat earlier than has been imagined; they should be milked nearly as possible at the same hour morning and evening; and as the grass appears, they should be turned out into a meadow for the day, and the milk by degrees left off. In the month of October the calves should be put into a house and tled, and three ounces of Glauber's salt should be given on three alternate mornings, to prevent the disease in winter, a warm pen, or dry pasture, should be allowed. If they have calves at two years old, they should be weaned in February, and they should not calve before May. If they are to calve at three years old, time and feed are not material.*

The cast-off cows and the steers are fatted sometimes on

* In many parts of this district, the calves are seldom reared. The farmers say they can generally buy them cheaper than they can rear them on land that is too good for the purpose, and rented too dear; and that calves will pay better as veal, than to be kept for stock. There is one thing, however, of which the farmers everywhere does not seem to be sufficiently aware, that few cows will settle on a farm, or turn out so profitable, as those that have been reared on it.

extent well founded, and from which dairymen every
re instruction. 'One circumstance,' says he, 'goes a
in the goodness of the North Wiltshire cheese, viz.,
ation of most of the farm-houses in the centre of the
e cows can be driven home to milk, and all the milk
, of an equal temperature, and, by beginning their work
can make cheese twice in the day. Where servants
detached and extensive pastures, this cannot be done.
erally be traced to some fundamental fault in the art
particularly in that essential article, the rennet.' We
n the author of the 'Survey;' that a great deal is to
d management, but we are inclined to think fully as
e, is connected with soil and pasture.

cheese that is made from each cow in this district was
mon in any other cheese-making country; sometimes
. or 5 cwt. per cow, seldom lower than 3 cwt. Per-
air average in a good cheese-making year on every
proper time*.

very different country. A considerable portion of it
nsive and open plains where sheep only will thrive.
e, comparatively few cattle kept in this district, and
fewer were there not much wet and boggy ground
ween the different elevations of Salisbury plain, and
not live†. The old Wiltshires never completely occu-

ese is, however, materially influenced by the season; Mr. Mar-
ion of this in his 'Economy of the Midland Counties.' 'One
ced four tons of factor's cheese, besides the expenditure of the
her upwards of 4 cwt. per cow; yet in the next year the same
of four or five more cows to the dairy, did not produce so much

as warm and moderately wet; neither too wet nor too dry; a
h and moisture. The pastures were eaten level even to a degree of
re a freshness, and the cows throughout the summer looked sleek
was a wet summer.'

h Society Papers, vol. vii. p. 170, very properly says, that 'the
is the smallness of the quantity kept, the rage for fine sheep
cow stock out of the district. South Wiltshire farms are not
cows, but the greater part of them would keep more than they do.
meadows cows are indispensably necessary to eat the after grass,
always so to eat the barley-straw, and make dung. There is
and on a South Wiltshire farm as the sheep-fold can manure;
e manured with hot dung, and particularly when in preparation
ws were formerly thought so useful as to be indispensable on
, they must certainly be much more so now when their produce

The improved short-horns lingered longer in Oxfordshire than of the districts which they had occupied. It has been stated, that Fowler, of Hollwright, derived his breed immediately from Mr. Bakewell, and carried the improvement of the long-horn cattle to a greater extent than Mr. Bakewell did. His bull, Shakspeare, has been already described as the best stock-getter that the long-horn breed ever had. After Bakewell died, his stock began to lose its high character under the management of his nephew, Mr. Honeybourn; Mr. Fowler's stock maintained their reputation for many years, until they, too, gradually yielded to the superior claims of the short-horns.

Before Mr. Fowler's time, Oxfordshire could not be said to have a peculiar breed, but the improved long-horns, bred and patronised by him, speedily became the prevailing stock of the county. A few long-horns, but somewhat deteriorated, are yet to be found in Oxfordshire; the long-horn, or the half-horn, or a mixture between the short and the long-horn native cow, principally prevail.

Sir C. Willoughby was one of the first who introduced the short-horn. He had a dairy of 19 cows of that breed. The very intelligent Secretary to the Board of Agriculture, the Rev. Arthur Young, (in his *Survey of Oxfordshire*, published in 1809,) could not quite reconcile himself to the intrusion, and speaks pointedly of the necessity of their being well fed and taken care of in the winter. This was a grand objection which

* 'Few reasons need be adduced to prove that the best kind of cow for this country is that which will bear *hard keeping* best, and particularly that kind which will bear wintering in a straw-yard.'—Bath Papers, vol. vii. p. 170.

The *cow-commons*, or *cow-downs* that used to be described by every statistician, and which were in a manner peculiar to the South Wiltshire and Hampshire districts, are diminished in number, and in many parts of these districts they are now unknown. These commons were on the best and most level parts of the down. Mr. Marshall gives the following account of them. 'The cattle are collected in a common herd, each township or hamlet having their cow-herd, who drives them to the common, tends them there, and brings them back in the evening to be milked, distributed among their respective owners, who take the charge of them during the night. The herdsman collects them again in the morning, by sound of horn, a custom probably of many centuries standing. I have seen a hundred head at least in one of the herds. In summer, when the weather is sultry, the cows remain in the house, and are fed there with grass and weeds collected for them, or are suffered to dung unprofitably in lanes, and other shady places, and are driven to the down in the cool of the evening.'

The stubble-fields being opened, they took possession of them also, in common with the sheep. If there are common meadows, they have no exclusive right to feed there until St. Martin's-day, when the owners take them home to the straw-yard. After that time the cows leave the cow-down to go into the stubble-field, it becomes common for the flock during all, or a certain part of the season, when it is again laid up for the

kingdom in order to select subjects on which to commitments, he selected two heifers from Mr. Webster's dairy of his future stock.

Blackford, soon afterwards emulated the example of produced a superior breed of cattle, hardy, short-legged, deep in their frame. He first hired bulls from Mr. Baker bred from his own stock until he bought a bull that was black, after which he still further improved his cattle by crossing with the long-horns.

He pursued the same laudable course, and the consequence was that Warwickshire cattle would not yield to the improved Leicesters at any point, but were acknowledged as genuine branches of the same stock. They also retained a considerable portion of all their qualities when Mr. Honeybourn's stock had dwindled into mere remnants of what they once were.

To this day, some long-horns are to be met with in Warwickshire. The most valuable dairy breed is at least a mixture of the long horn and the short-horn. The short-horn is, however, gaining ground. Mr. Young had a fine breed of pure Durhams at his seat Chateaufort, some of which were afterwards purchased by Mr. King, then of Slade House, in this county.

Mr. Young, to the Board was always partial to the use of oxen at the plough. The advantage and disadvantage to be derived from using them was more to the test of experience than in Oxfordshire, and the consequence was that farmers who had tried both the Devons and the Hereford, returned to the horse. Mr. Young, however, gives an account of the experience on the contrary side of the question, so interesting, that we are induced to quote it. 'Mr. Thomas Latham, of Clifton, had a team of four oxen that drew a waggon of wheat in a waggon; and which were far beyond horses for they were Scotch beasts. He worked them three years, and sold them for as much as horses, and did not cost nearly so much. Mr. Bignal, worked a team of five spayed heifers in harness. He had them at two years old; they were in full work at three, and fat enough to have sold them as high as 100*l.* per pair. They were not shod, and on a rough surface, they worked as well as horses.

Mr. Young, who published a 'Survey of Warwickshire,' in 1813, gives the following results per acre, on different kinds of farms and differently managed.

under the rotation of fallow, wheat, beans, barley, clover,	£.	s.	d.
Loss.	0	1	6
on marl or limestone rock, same rotation	Gain.	2	14 9
heavy soil under the rotation of turnip, fallow, from turf, sheep, barley and seeds, clover eaten off by sheep	Gain.	0	5 0
under rotation of wheat, after leys, and the other crops,		2	8 2½
		3	4 0
		4	9 0

her qualities, even more valuable in a dairy country; they are enriched, but it was materially diminished in quantity, and eight of cheese was not obtained; and, therefore, they are restored to a certain degree; the milking properties of the cows are restored, while superior form, and size, and grazing power to a considerable extent retained.

Cows had now become an exceedingly valuable breed; they were found in the neighbouring counties, and great numbers of them were sent to supply the dairies of North Wiltshire. On the Wiltshire side, cheese was produced equal to the finest of that of the Derbyshire side, the production of that district was equal to the cows, the dairy work being done, were superior to any other county, and not inferior to those of the latter, in the

*. There is a better kind of cattle than the long-horn of the cottager still under the name of the 'old Staffordshire long-horn' to be bred in some parts of the county. Among others, Mr. Old Wood, near Rudgely; Mr. Parton, Bromley-Hurst, near Holland, Lee-Lane, near do.; Mr. Bakewell, Oak-Fields, near Lichfield; Mr. Ashmell, do.; all bred from the long-horns. Mr. Bakewell is President of the Agricultural Society.

Mr. S., of Walsall, has favoured us with the following account of the Staffordshires of the present day. 'The prevailing colours are grizzled or brindled with an irregular broadish

There is a singular account of the method of rearing calves in his time, in which they are here fattened at the teat, and in the early part of the season are put to cheese-making once begun, they are butchered as they drop, at three or four days old, nor at more perhaps than three or four weeks of age, for market, the manufacturing towns and the collieries of Stafford-

There is a singular account of the method of rearing calves which requires to be used by some individuals—but not, I believe, in universal practice. It is quiet, and more especially during the temporary scarcity of milk, when it takes place. In this case, balls made of wheat-flour, and a sufficient quantity of water mixed with it into a paste, are given them; three balls about the size of walnuts are given at a quarter of an hour after each meal. The effect is, that instead of being kept by incessant bawling, they lie quiet, sleeping a principal part of the day. By this custom, the calves get fond of these paste-balls; eating them with relish—a proof of their being acceptable to their stomachs. As an excellent remedy, and may be of service to a restless calf even when milk is scarce. (Northamptonshire, vol. i. p. 350.)

Paste or *gin-bali*, when calves are taken a long way from one market to another, as already spoken, in the account of Northamptonshire.

great weights, varying from about 40 to 70 stones of 14 lbs. to the cwt. They are deep in the brisket, and the fore-quarters weigh heavy. They are, generally speaking, very quiet and docile, not disposed to run, and are kept in bounds by small fences. The milk is rich in cream, and will make proportionably more butter and cheese, though it is acknowledged they will not give so much in quantity as the short-horn, both living well alike. They are said to require a less quantity of food, though I am convinced they will not do on that of a worse quality than the others, from what I saw at Lord Bagot's, at Blythfield Park. He had a number of long-horned and Hereford cows, each good of their kind, and tied up in the same range of building, and the bailiff informed me that the Herefords had been eating hay inferior to that eaten by the long-horns, and yet the Herefords beat them decidedly in condition. He also made work a number of bullocks on the farm; and he told me also, that he had tried the long-horns for this purpose, but found them not at all equal to the Herefords, either in pace or in capability of enduring fatigue. The long-horns are still very hardy in constitution, and, from the coarseness of their hides, are calculated to bear inclement weather better than the Herefords, and this, added to the shortness of their legs, gives them the advantage in rough weather and a bare pasture.'

At length the short-horn, in the course of its triumphant career, reached the borders of Staffordshire, and some spirited breeders immediately put their boasted value to the test. Some of the best short-horn bulls were procured, and the Staffordshire cow was crossed by them. Various degrees of success attended these crossings, according to the skill with which they were conducted, and, on the whole, the symmetry of the animals was considerably increased; the weight and disposition to fatten were increased too; a twelvemonth was gained in point of ripeness for the butcher, the quantity of milk was greater, and to an extent which made it more profitable to dairymen, although it might be somewhat deficient in quality, and a very profitable breed this seemed to be.

It may, however, be imagined that the Staffordshire farmers were jealous of this innovation, and many of them clung tenaciously to their favourite breed; but, at length, experience convinced them that great improvement was effected in their cattle by the introduction of the short-horns, than the Leicesters of Bakewell had ever been able to effect. That the improved Staffordshires soon became even more rare than the old natives, and a cross between the long-horn and the short-horn prevailed in most of the dairies in the southern part of the county.

It was, however, necessary to have frequent recurrence to the

...; other breeds have been tried, and have then
all retains the long-horns, and in their purest state.
Anson had a fine breed of white cows, which he changed
sires improved by the Leicesters, and which he after-
wards adopted the Devons. Mr. Tollett, of Betley, had
so had Mr. Childe, who selected them with great care,
very high prices at an annual fair. Sir George Pigott
alloways at Pateshall, and farther to the north, Lord
the stock of Herefords.

Wesley once crossed his heifers with a French bull. The
beautiful, and fattened very quickly and well, but when
meat was of a bad colour.

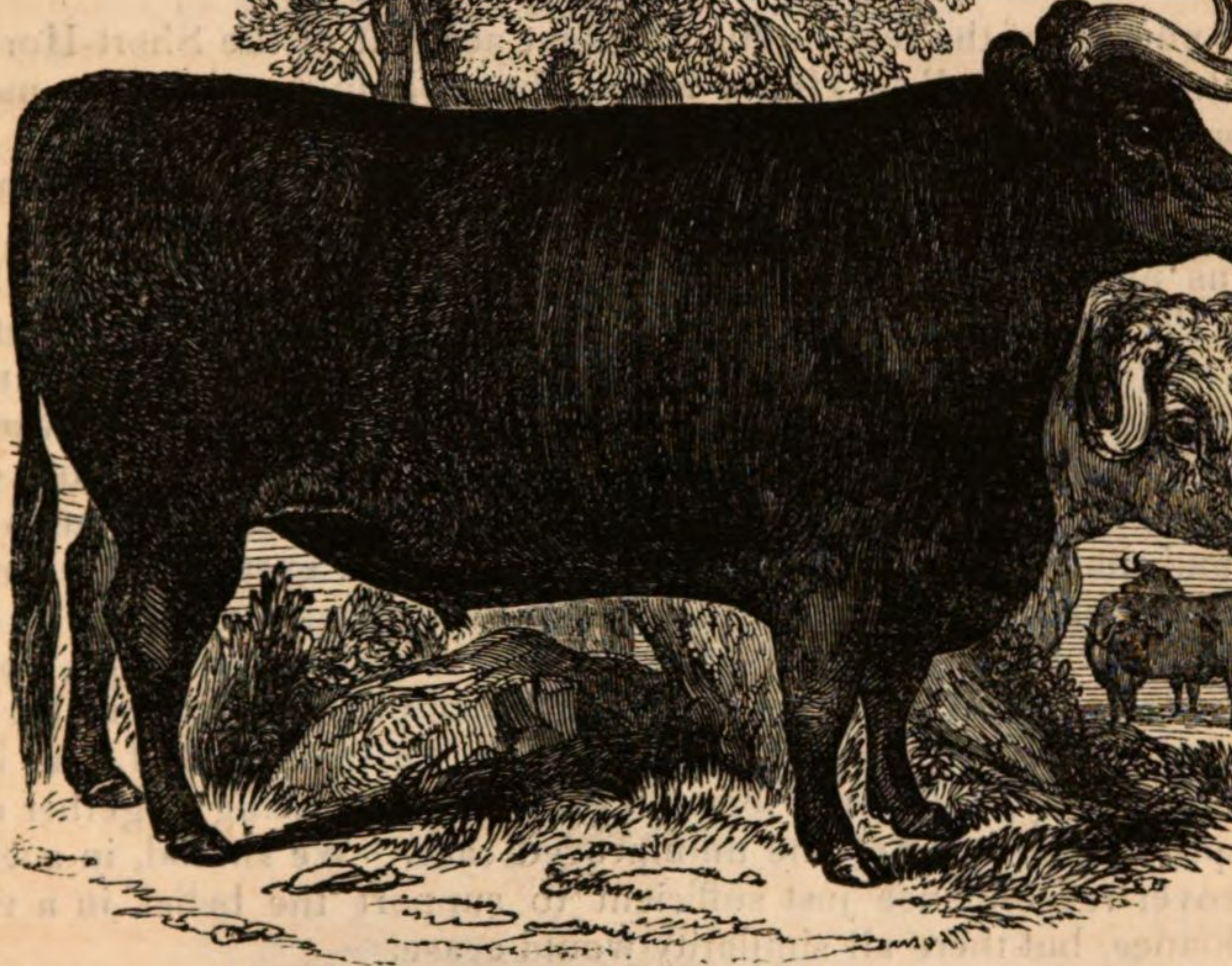
North of the county, the long-horns continue to main-
tain, and particularly on the banks of the Dove and the
separate Staffordshire from Derbyshire. A cross between
Staffordshire cattle there prevails. The fore-end is fine,
and low. The head small, the neck thin, but deep accord-
ing to the bosom. The shoulders fine, the rib full and the
thighs remarkably thin below, as if to give room for the
udder, clean, and bladder-like, with long teats, and remark-
able milk veins. The leg short, with the bone fine.

The hide of a middle thickness. The colour of a
red with a fine back and white legs. In temper very gentle,
of considerable value in a cow intended for the pail.

The difference between this and the improved long-horn is,
the former is more roomy and better let down in the chest; the
latter is rounder, fuller on the chine and loin, and generally fuller on
the sides, clean in the fore-end and shoulder; the bone of both
is good; but the one loses her milk a few months after
calving, while the other will milk all the year round.

The peculiarity of management in Staffordshire, as it regards
the adult animal. We beg leave to return our acknow-
ledgments to Earl Talbot, and Sir John Wrottesley, for the kindness
they have furnished us with information on several important points.

Of the Durham with the Holderness, he very satisfactorily accounts,
and we have had the honour to receive from him. 'I do not believe,' he
says, 'a milker will have the same disposition to fatten as a bad one, and
consequently, the heifers that have a great disposition to feed are indisposed
to fatten. This circumstance has induced me not to covet very high-bred animals, and to
use the milk to assist in feeding, when too old to continue in the



[*The Old Shropshire Ox.*]

Very few of the old sort are now left, but a cross between the shire and the Holderness has been established, by which increase has been obtained, hardihood, and a greater quantity of milk. They are very docile; and when red or spotted they are in great request: they are accounted the most valuable. This cross, however, should be kept on good sound land; on wet marshy land the old Shropshires are best. The cows sell well in spring, having calved, or being near calving time. The price of one of average goodness will be from 18*l.*, while a cow of the old Shropshire kind, and of the same size, would not bring more than from 9*l.* to 12*l.* They are more profitable for the butcher. They feed quickly in good pasture, and the beef is excellent.

The Herefords are established through the whole of Shropshire, and are occasionally seen in the dairy, and they occupy the greater part of the grazing grounds.

A few Montgomeries with smoky faces, and also some other breeds, are kept in some parts of Shropshire, but they are generally the hands of cottagers and small farmers, who purchase them because

on of the text in this excellent account of the Short-Horns,
to the Rev. Henry Berry, than whom there are few more
of cattle, while there is no better judge of them.

Differences of opinion may prevail respecting the compara-
r several breeds of cattle, it must be admitted that the
sent themselves to notice under circumstances of peculiar
essing in an eminent degree a combination of qualities
erally been considered incompatible, and rendered irre-
e to the eye by their splendid frames, and beautifully varied
ot surprising that they have become objects of public cu-
ey have realized for their breeders enormous sums of
at, throughout our own island, and in every foreign coun-
ulture is attended to, they are in increasing request.

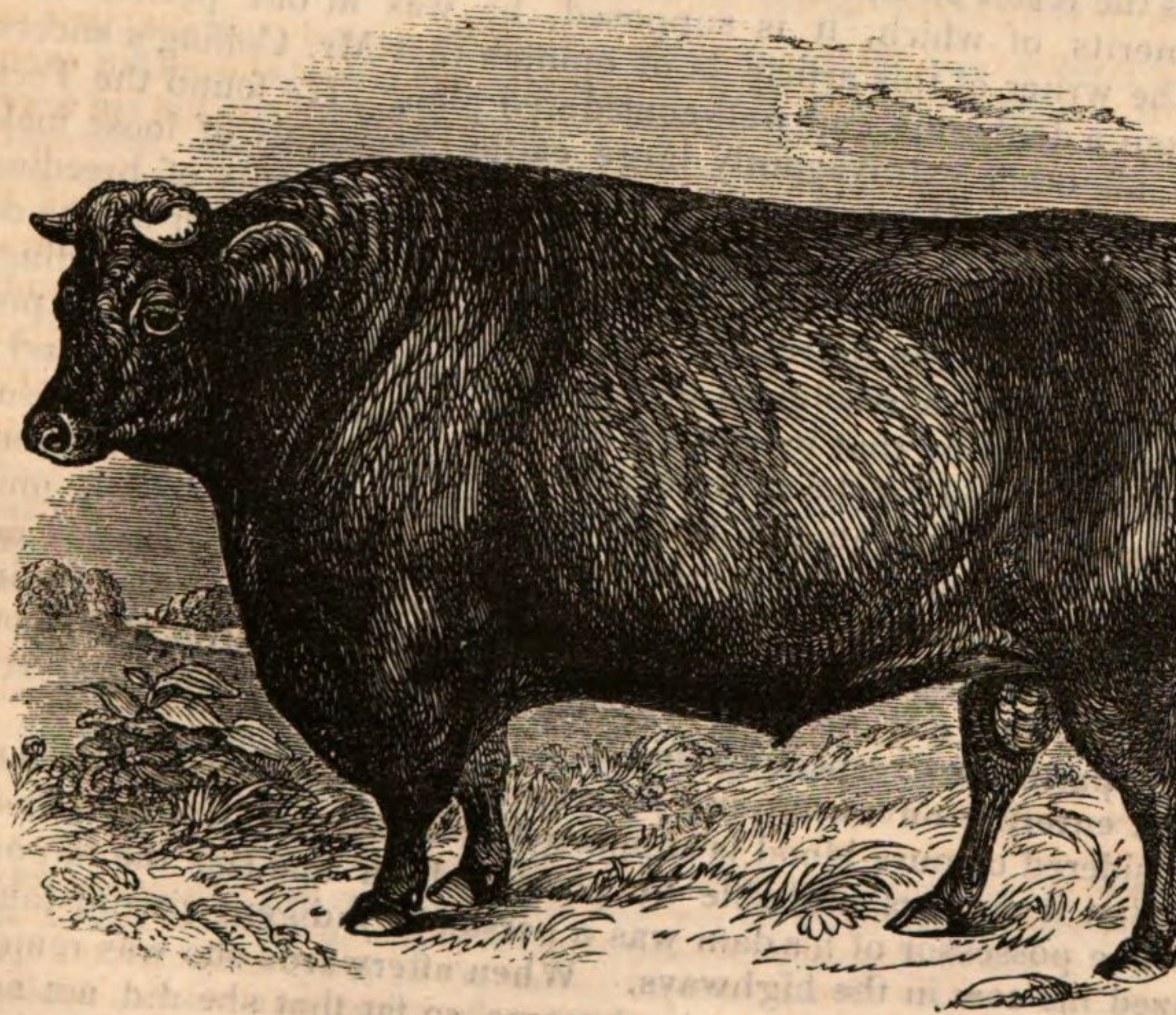
d to throw much light on the science of breeding, could
e traced, in the progress of their improvement, to an earlier
hitherto been found possible. Of the extent of that im-
may, however, form an estimate, by placing together one
d, and one of the unimproved race. We should, in such a
resemblance just sufficient to support the belief in a very
, but there all similarity would cease.

earliest periods as to which we have any accounts of our
e, the counties of Durham and York have been celebrated
-horns, but principally, in the first instance, on account of
n as extraordinary milkers*. To recite their recorded
il would be to invite incredulity; but it may be asserted,
dence, that, taken as a breed, they have never in this par-

large and valuable description of cattle had existed on the western coast
f Europe, and extending from Denmark to the confines of France. They
r the great quantities of milk which they yielded, and some of them ex-
ordinary aptitude to fatten. At what particular time they found their
or by whom they were imported, is unknown; but there is a tradition
close of the seventeenth century, a bull and some cows were introduced

m, there appeared to be very little to recommend them, for they had
nd coarse necks; the sides were flat, and the head was thick; all the
bulky, and the prime ones were reduced in size, and they were almost
at the agriculturist would select: they were, however, bulkier than the
d they were better milkers than the generality of the cattle of that day.
int of feeding, grow to an enormous size, but they had not the aptitude
early maturity, to which they have been since indebted for their triumph
breed.—*Edit.*

had assumed a very different character to that contained in the description. In colour, they resembled the improved short-horn, occasionally red, red and white, and roan, though the last-named was not then so prevalent as now. They possessed a fine constitution and flesh, good hair, and light offal, particularly wide carcasses and quarters of extraordinary depth and capacity. Perhaps no closer resemblance can be found to the above description of the breed than Mr. Berry's bull presents, the portrait of which is given in this account. His dam was purchased by Mr. B. on account of a few crosses that intervened between her and some of the best Teeswater cattle, to which he was desirous to go back, on account of the extent to which breeding *in and in* has been carried. When sired their proof was extraordinary, and many instances are recorded of the wonderful weight of their inside fat.



[Portrait of Rev. Henry Berry's Bull.]

ed with conjectures, as to what other breeds were resorted much is certain, that great improvement was soon man-
luable variety established, as the two following instances

of Barmingham, one of the leading improvers, bred and
ox, which, at five years old, weighed four quarters, one
y stones, of fourteen pounds to the stone, producing six-
allow; and a cow bred from his stock, slaughtered by Mr.
on, at twelve years old, weighed upwards of one hundred

lbank's time, the Teeswater cattle continued to sustain
and celebrity in various hands, until Mr. Charles Colling
when he manifested a superiority of skill as a breeder,
brief period, secured him an ample fortune.

been the merits of the Teeswater cattle, it is certain Mr.
mproved them; and though it has been asserted that his
result of chance, arising from the possession of an animal,
of which, it is supposed, he was at one period unac-
iter of this article is of opinion that Mr. Colling's success
deliberate and well-considered plan. He found the Tees-
other extravagantly large cattle, frequently of loose make
on. He was sensible, also, of the difficulty of breeding,
ke certainty, *large good* animals; and though he has de-
casions to throw any light on his views and proceedings,
s he can detect, in the very outset, and through the pro-
ctice, a resolution to reduce the size of this breed, and at
and by that means, to improve its form. This he is sup-
fected, in the first instance, through the medium of a bull,
k," an animal respecting which there has been much
ncipally touching the purity of his blood, a question now
nce, because it is admitted on all hands that Mr. Colling
cross, which prevails in a majority of superior short-horns
lay. It may, notwithstanding, be matter of interest to
culars respecting this bull.

ing on an inquiry by what circumstances Hubback's title
of pure blood is supported or weakened, it may suffice to
appears probable he possessed on one side the imported
essor of his dam was a person in indigent circumstances,
ow in the highways. When afterwards she was removed
ear Darlington, she became so fat that she did not again
son, having the same feeding propensity in a high de-

years old, the Durham ox was sold to Mr. Bulmer, of Ha Bedale, for public exhibition, at the price of 140*l.* : this was i 1801. He was at that time computed to weigh 168 stones, live weight being 216 stones; and this extraordinary weight arise from his superior size, but from the excessive ripeness of Mr. Bulmer having obtained a carriage for his conveyance with him five weeks, and then sold him and the carriage, at to Mr. John Day, on the 14th May, 1801, for 250*l.*

On the 14th of May, Mr. Day could have	£.
sold him for	525
On the 13th of June, for	1000
On the 8th of July, for	2000

Mr. Day travelled with him nearly six years, through t parts of England and Scotland, till at Oxford, on the 19th 1807, the ox dislocated his hip-bone, and continued in that 15th April, when he was obliged to be slaughtered, and, notv

* This is true, because Hubback was the sire of the dam of Mr. Ch bull, Foljambe, who was the grandsire of Favourite; and there can be there has not been for many years any superior short-horn who was not o Favourite. Mr. Charles Colling is said to have considered that the bull, the one who did his stock the greatest good; and this is not improbable was the sire both of the sire and dam of Favourite. Hubback, however, r a remarkably good animal, and considering the short time during which a bull, proved himself a first-rate stock-getter.

The following account of 'Hubback' we had from Mr. Waistell, o although his name does not appear conspicuously in the 'Short-Horne deserves much credit for his discrimination here. He used to admire t rode almost daily by the meadow in which it grazed; and at length he at chase it from the owner. The price asked, 8*l.*, seemed much for a calf and the reputation of the short-horns not being yet established, the ba struck. Still he longed for the young beast; and happening to meet Mr. near the place, he asked his opinion of the animal. Mr. Colling acknowle were some good points about him; but there was something in his man ledging this which induced Mr. Waistell to suspect that Mr. Colling tho more highly of the calf than his language expressed, and, therefore, he ha morning, concluded the bargain, and paid the money. He had scarcely Mr. R. Colling arrived for the same purpose, and as the two farmers rode they agreed that it should be a joint speculation.

Some months passed by, and either Mr. Waistell's admiration of the cal or his partner did not express himself very warmly about the excellencies and Messrs. Waistell and R. Colling transferred young Hubback to M who, with the quick eye of an experienced breeder, saw the value of the lit Waistell expressed to us (October, 1832) his regret (natural enough) a induced to part with the sire of the short-horns, and his extreme disap when Hubback began to cover, Mr. Charles Colling confined him to his would not let him serve even one of Mr. Waistell's cows.—*Edit.*

obtained fact, that during his career as a breeder, Mr. Colling had made several experiments in crossing, and the breeds to which he had applied, on various occasions, being very considerably smaller than the short-horn, this circumstance tends to corroborate the writer's opinion that he was not likely to be able to reduce their size. The cross with the Kyloe led to no further enumeration, but that with the *polled galloway* must stand without comment. Before stating the circumstances of the experiment, it may be proper to observe that no breed of cattle was so successful a cross with the short-horns as the galloway. Adapted, by their deep massive frames and short legs, to bring their horns nearer the ground, and to dispose their weight in a more compact manner: their hardy habits would be essentially useful, and their fine skin and hair were such as to render the experiment very desirable. Add to this, that they could be obtained of a red colour; and it would be hard to admit, even without the sanction of a successful experiment, that they were admirably adapted to cross with the short-horn. Frequently too high from the ground, not very well ribbed, and with a looseness of loose, disjointed frame.

Mr. Colling resolved to resort; and though at the time the event was regarded with some degree of ridicule by the advocates, and comments passed which would have deterred men from the exercise of their judgment, Mr. Colling

was favoured by circumstances in promoting his object, which rendered the cross, and then breed back to the short-horn,—the only way, in which crossing can be successfully adopted. To suppose that the produce of a cross *directly among themselves* will lead to the same result, have induced many persons, without due consideration, to be so positive against crossing; but to take one cross, and then breed back to one breed, will, in the course of a few generations, produce a variety with sufficient certainty.

A short-horned bull *Bolingbroke* was put to a beautiful *galloway* cow, and the produce, being a bull-calf, was, in due season, put to a *galloway* cow, and she produced a bull-calf. *Bolingbroke* was the sire of the cow, *Lady*, by another *galloway* dam, and from *Lady* has sprung the highly valuable short-horns, termed, in reproach, the *alloy*. How far the experiment is successful, let *facts* testify*.

Lady was also the dam of the bull *Favourite*; and as the grandson of *Bolingbroke* is known to have been the sire of any other remarkably good animal, it is evident that the unquestionable merit of *Lady* and her descendants is to be ascribed to her dam rather than to her sire.—*Edit.*

sum than any other family obtained *.

* The whole particulars of this first grand sale of short-horn stock ought to be served. We extract it from Mr. Bailey's Survey of Durham.

A Catalogue of Mr. C. Colling's Sale of improved Short-Horned Cattle
October 11th, 1810.

COWS.

Names.	Out of	Got by	Cows' Age.	Bulled by	Sold for. Gs.	Bought by
Cherry	Old Cherry ...	Favourite	11	Comet ...	83	J. D. Ne Hought Durham
Kate.....	.....	Comet	4	Mayduke	35	Mr. Hunt, ham.
Peeress.....	Cherry	Favourite . .	5	Comet ..	170	Major. Ru Yorkshi
Countess ...	Lady	Cupid	9	Do ..	400	Do
Celina	Countess	Favourite	5	Petrarch	200	Sir H. Ibb Denton shire.
Johanna....	Johanna.....	Do.		Do. ...	130	H. Withar Hall, Y
Lady	Old Phoenix...	{ A grandson of Lord Boling- broke..... }	14	Comet ...	206	C. Wright by, Yorl
Cathelene...	{ A daughter of the dam of Phoenix }	Washington...	8	Do. ...	150	G. Parker Malton,
Laura	Lady	Favourite	4	Do. ...	210	Mr. Grant
Lily	Daisy	Comet	3	Mayduke	410	Major Ru shire.
Daisy	Old Daisy	{ A grandson of Favourite... }	6	Comet ...	140	Major B ham, Y
Cora	Countess	Favourite	4	Petrarch	70	G. Johnso Scarbor
Beauty	{ Miss Washing- ton	Marsh	4	Comet ...	120	C. Wright
Red Rose ...	Eliza	Comet	4	Mayduke	45	W. C. F near D
Flora .....	.....	Do.	3	Do. ...	70	Earl of L
Miss Peggy .....	.....	{ A son of Fa- vourite. }	3	Comet ...	60	O. Gasco Paringt shire.
Magdalene	{ A heifer by Washington }	Comet	3	Do. ...	170	— Char Blyth, M

.. 1 Venus	Comet	110	{ Mr. Robinson, Yorkshire.
.. 1 Duchess	Do.	105	{ A. Compton, Esq., Carham, Northumberland.
.. 1 Cora.....	Do.	63	Mr. Fenton.
.. 1 Magdalene....	Favourite.....	76	Earl of Lonsdale.
.. 1 Red Rose.....	Windsor	50	{ Sir C. Loraine, Northumberland.

2249

BULL-CALVES, UNDER ONE YEAR OLD.

Out of	Got by	Price. Gs.	Bought by
.Cherry	Comet	50	Major Bower.
.Countess	Do.	140	{ — Skipworth, Esq., Lincolnshire.
.Lady	Do.	130	— Walker, Esq., Rotherham.
.Daisy	Do.	90	T. Lax, Esq., Ravensworth.
.Flora	Do.	15	Mr. Wright.
.Beauty	Do.	60	T. Booth, Esq., Catterick.
.Peeress	Do.	170	{ H. Strickland, Esq., Boynton, Yorkshire.

655

HEIFERS.

Age	Out of	Got by	Price. Gs.	Bought by
.. 3	Dam by Favourite ..	Comet	105	Sir H. Ibbetson.
.. 2	Do.	Do....	183	{ T. Bates, Esq., Halton Castle, Northumberland.
.. 2	Laura	Do....	101	Earl of Lonsdale.
.. 2	Countess	Do....	206	Sir H. Ibbetson.
.. 2	Dam by Washington	Do....	132	Mr. Wright
.. 1	Cathelene	Do....	136	Mr. R. Colling.
.. 1	Johanna	Do....	35	G. Johnson, Esq.

808

HEIFER-CALVES, UNDER ONE YEAR OLD.

Out of	Got by	Price. Gs.	Bought by
.Laura	Comet	106	Mr. Grant.
.Cora	Do.	50	{ Sir H. V. Tempest, Bart., Winyard, Durham.
.Lily	Yarbro'	75	Mr. Strickland.
.Red Rose ...	Do.	50	Major Bower.
.....	Comet	25	Earl of Lonsdale.

306

From



[*The Rev. H. Berry's Cow.*]

It would answer no useful purpose, and would certainly be a questionable course, to bring under particular notice any one or more highly valuable stocks of improved short-horns of the present time; to enumerate all would be impossible; and the writer of this account most studiously avoid any partial or invidious comparison. No objection does not, however, exist, as to a remote period; and for the justice to state that Mr. Robert Colling, brother of Mr. Charles Colling, certainly was the leader, and surpassed all competitors in the improvement of the short-horns,*) Mr. Charge, of Newton, near Darlington.

From the above it appears that

	£.	s.	d.
17 cows were sold for.....	2802	9	0
11 bulls	2361	9	0
7 bull-calves	687	15	0
7 heifers	942	18	0
5 heifer-calves	321	6	0

In all 47 were sold for7115 17 0

* Mr. Robert Colling's stock was not sold off until the 29th September, the following great prices were obtained for some of his cattle, a sufficient estimation in which they were held :—

One 2-year old cow	.. . . .	sold for	.. . . .	331 guinea
One 4-year old cow	.. . . .	„	.. . . .	300 „
One 5-year old cow	.. . . .	„	.. . . .	370 „
One 1-year old bull-calf	.. . . .	„	.. . . .	270 „
One 4-year old bull	.. . . .	„	.. . . .	621 „

It appears by the catalogue, with printed prices affixed, that

34 cows	.. . . .	sold for	.. . . .	4141 guinea
17 heifers	.. . . .	„	.. . . .	1287 „
6 bulls	.. . . .	„	.. . . .	1343 „
4 bull-calves	.. . . .	„	.. . . .	713 „
61 head of cattle	.. . . .	„	.. . . .	7484 „

Short-horn Field Book — Mr. George Coates. He is the oldest authorities on the subject in existence, and was the possessor of a very superior race of short-horns, though some portraits have been preserved of some very fine animals and he had the solid satisfaction to dispose of his bull for a hundred guineas.

He fell into an error, but too common, and generally equally with his own stock the best, and disdained to cross them with any other, which, as others afterwards proved, would have been a very unwise proceeding. The consequence was, Mr. Colling's sale of the public judgment and taste, Mr. Coates's stock fell into disrepute. An apology be requisite for this statement of an undeniable fact, found in the utility of holding up such an example as a warning to those who may be in danger of falling into a similar error.

It is to be regretted that the specimens already appealed to, and the fine portraits accompany this account, the property of the noble Duke of Devonshire, will render superfluous any attempt to describe the short-horns. Of course they will be greatly interested; but sufficient may be collected from what is pre- sented to inform him as to the character of this superior breed.

The next object, then, will be to show their capabilities for food consumed, and the unparalleled early period at which they may be made. Indeed, *early maturity* is the grand characteristic of the short-horns, and their capacity to consume food and at the same time attaining an unexampled ripeness of age, has excited the wonder, and obtained the approbation of those who are not blinded by prejudice.

To do justice to the subject, and to show that these properties are not an acquirement, but were possessed in an eminent degree by the original cattle, as well as the improved short-horns, it will be requisite to quote the former for a few facts in evidence.

Some years ago, Sir Henry Grey (of Howick) bred two oxen, by Mr. Waistel, and when six years old weighed 130 stones each; their inside fat being most extraordinary.

Two years ago, bred by Miss Allen (of Grange), fed on hay only, weighed 90 stones.

Towards the close of the last century, General Simson's stock of the same breed were sold at his seat at Thrapston. As a proof of the established reputation of the short-horns, even in the degree to which they would even then thrive, in a climate so different from that of the north, it may be stated that 12 cows, 5 two-year old heifers, 3 bull-calves, 1 one-year old heifer, and 6 quey calves, 37 in all, sold for 1388 guineas, a very high price for the breed.

For a description of Lord Althorp's cow and heifer, see pp. 236, 237.

A sister to Mr. G. Coates's *Badsworth*, having run with her dam as she did, without cake or corn, met with an accident, and was killed when seven months old; she weighed 34 stones.

A steer, by a brother to the above heifer, three years and two months old, weighed 105 stones; and another steer, by the same bull, three years old, weighed 95 stones. Both were kept as store-bulls two years old.

An ox, bred by Mr. Hill (of Blackwell), slaughtered at six years old, weighed 151 stones, 10lbs.; tallow, 11 stones.

The Howick red ox, seven years old, weighed 152 stones, 9lb.; 16 stones, 7lb.

Mr. Charge's ox, seven years old, weighed 168 stones, 10lb.; 13 stones.

The foregoing instances of weight and proof satisfactorily show the Teeswater cattle, Mr. Charles Collins had pretty good material which to commence operations. Let us now refer to a later period, and state some particulars respecting their descendants, the improved short-horns.

In the year 1808, Mr. Bailey, the agricultural historian of Durham informs us, he saw, at Mr. Mason's (of Chilton), a cow, not less remarkable in point of fat than the Durham ox. At that time, the depth of fat from the rump to the hips, in a perpendicular position, was not less than nine inches; and the shoulder score, at least nine inches thick.

Mr. Robert Colling's heifer, which, like the Durham ox, was esteemed as a curiosity, was estimated, at four years old, to weigh 130 stones.

The same gentleman sold, in Darlington Market, on the 18th of December 1808, a two years'-old steer for 22*l.*; the price of fat stock being at that time seven shillings per stone.

At Mr. Nesham's (of Houghton-le-Spring), Mr. Bailey saw a steer, 18 months old, completely covered with fat over the whole carcase, and supposed to be the fattest steer of his age ever seen. Butchers estimated it to weigh 75 stones. Neither of the last-mentioned were of large size; they would not have weighed above 40 stones had they been no fatter than those usually slaughtered.

Mr. Wetherill (of Field House) sold at the fair in Darlington, in 1810, two steers, under three years old, for 47*l.* 10*s.* each. The price of the cattle at that fair, 10*s.* per stone*.

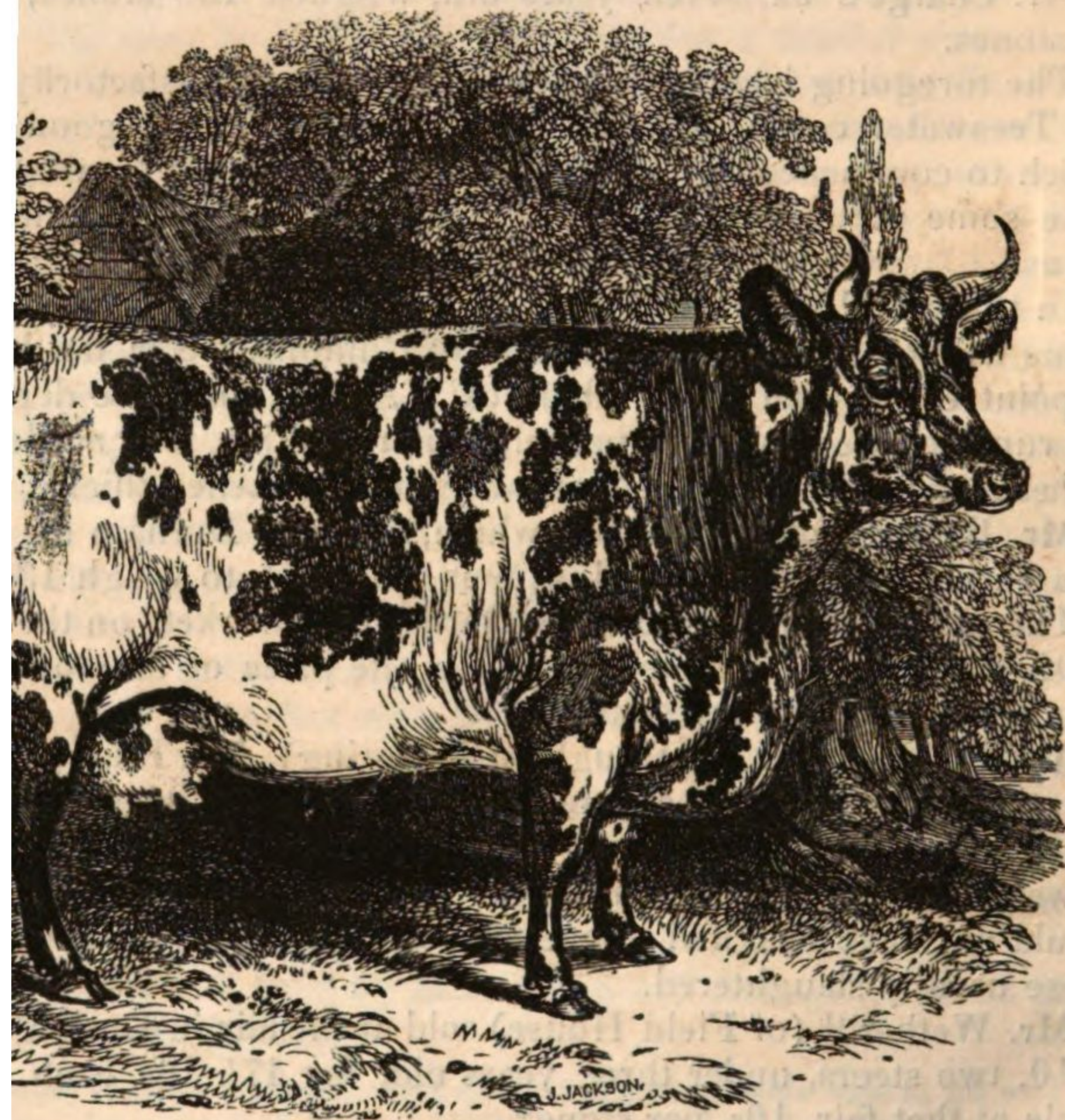
* Mr. Bailey observes, that the common practice among the breeders of the short-horns, and which he first observed at Mr. Wetherill's, was to put the yearling bull to the bull the beginning of July, so as to calve not later than the middle of March.

ember put to turnips through the winter, and turned to
week in May.

er, belonging to Mr. Arrowsmith, calved the last week in
kept the first year as the store-stock, was entered for a
to be shown in June, at which time she would be two years
immediately turned to grass in the usual pasture. In No-

nd sucked their dams until August. The cows were then put upon foy
winter with turnips, and sold to the butchers in May or June following
rage, which, with the value of the calf, could not be reckoned at less
ree-year-old heifer.

are portraits of a cow and heifer belonging to Lord Althorp:—



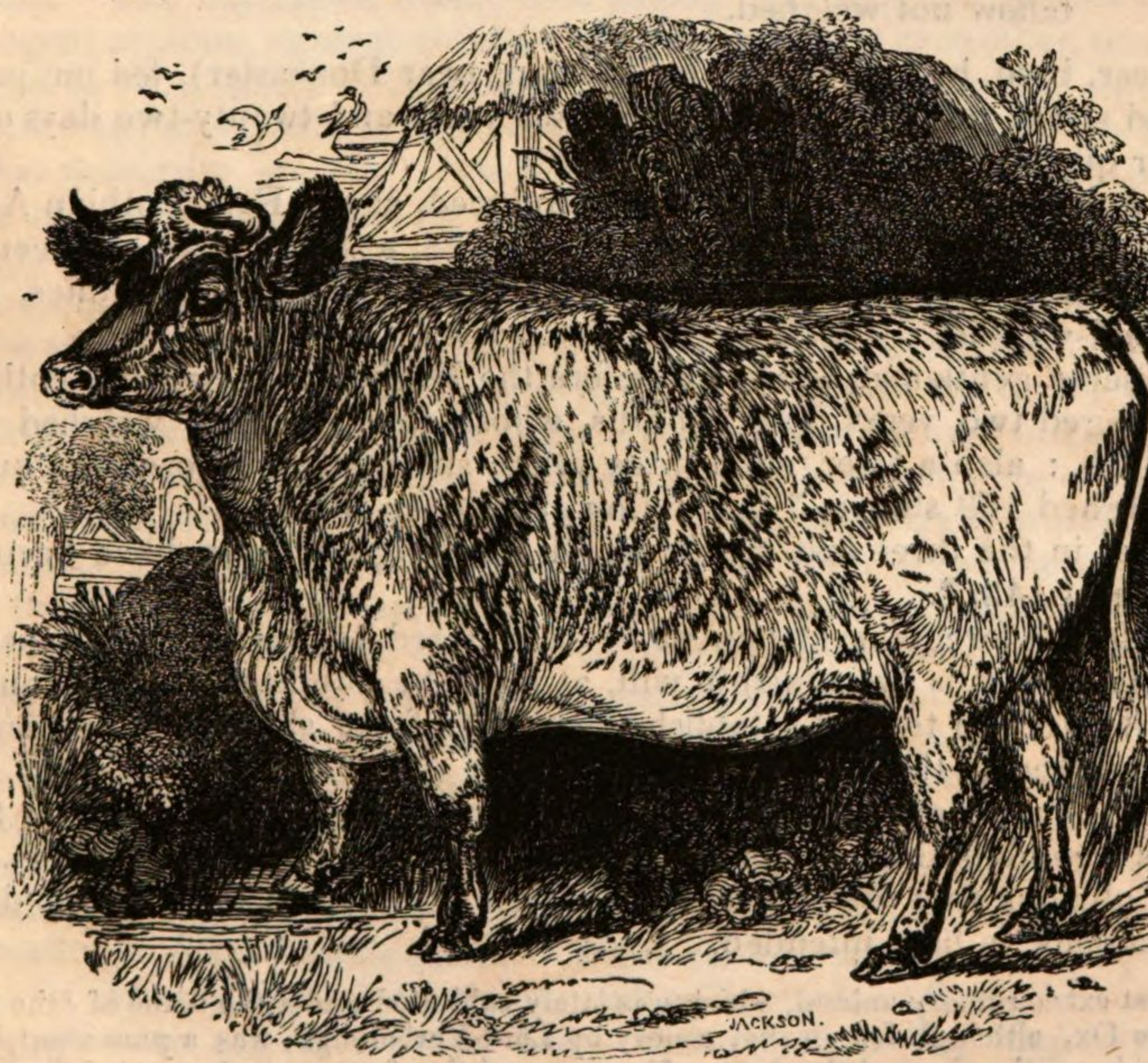
[*Lord Althorp's Cow.*]

ked in his lordship's herd-book by the figures 25, is particularly dis
excellence of her crop, plates, and loins.

He often, for the sake of experiment, bought in calves of the improved breed of the county, and he uniformly found that his own at two years old got fatter, and fitter for the butcher, than the others did although fed and kept exactly alike.

Mr. Mason (of Chilton), in the course of an experiment to ascertain the weight of beef gained by the food given (turnips), found three steers under three years old, to have gained 20 stones each in 20 weeks; the three steers averaged 70 stones each.

In 1816, Mr. Nesham's steer, three years and a half old, obtained the premium offered by the Durham Agricultural Society; his weight was 4 quarters, 96 stones, 1½lb.; tallow, 11 stones, 7lb.; hide, 8 stone



[*Lord Althorp's Heifer.*]

The heifer, called *Clarion*—a daughter of the opposite—is equal to her dam in points, and far superior in some others: particularly in her rump and hips. A very fine specimen of the short-horn heifer.—*Edit.*

er, three years, eleven months old ; four quarters, 112 stones, 1lb. ; tallow, 26 stones.

er, three years, eight months old ; four quarters, 89 stones.

er, three years, two months old ; four quarters, 95 stones, 1lb. ; tallow, 17 stones, 10lb.

er, four years and a half old ; four quarters, 135 stones ; tallow, 21 stones.

brother to the foregoing, three years and a half old ; four quarters, 133 stones ; tallow, 21 stones.

er, three years, ten months old ; four quarters, 124 stones ; tallow, 17 stones.

er, three years, eight months old ; four quarters, 112 stones ; tallow not weighed.

ed by Col. Cooke (of Ouston, near Doncaster), fed on potatoes, was slaughtered when two years and twenty-two days old ; quarters weighed 72 stones.

Rennie (of Phantassie) produced, at the East Lothian Agricultural Society's meeting, in November, 1823, a steer, from eighteen to twenty months old ; the four quarters of which weighed 118 stones, 1lb. 10oz.

A gentleman produced before the Highland Society of Scotland a steer, two years, four months, whose four quarters weighed 153 stones, 169 stones, 7lb. ; tallow, 30 stones, 1lb.

In the three last instances, all the weights given have been by the Highland Society.

The foregoing statement be considered to have been unreasonable, it is presumed it will, at least, be admitted, that its ample evidence, will establish the credit of the short-horns as an improvement to the grazier.

At the commencement of this account, however, it was stated that they were a combination of qualities, hitherto considered incompatible. It is that the disposition to feed rapidly, in union with dairy qualities, is here intended.

An extraordinary animal, which was lately exhibited under the name of 'the Linlithgow', although fed in that county by Lord Yarborough, was a pure short, both the sire and the dam. He measured five feet six inches in height at the withers, five feet ten inches from the nose to the setting on of the tail, eleven feet in length, and three feet three inches across the hips, shoulders, and middle of the breast was only fourteen inches from the ground, and he stood one foot between the fore legs.—*Edit.*

This may be rendered more intelligible by a short illustration. Suppose half a dozen animals to be selected in consequence of their particular quality; which quality it is proposed, on a certain principle of breeding, to increase and render almost permanent union. Suppose the animals so selected to come from the breeders who have neglected the milking property; the consequence will be, that the very union which develops and produces the desired object will tend, on the same principle, to increase the milk. In short, it will render it *habitual* in the produce. But the objection, by a *selection*, is supposing too much in the probable success. The objections which exist among breeders, for various cogent reasons, against crossing with the stocks of each other, usually lead to the practice of breeding in and in; which, in case of any deficiency of the milking property, must unquestionably go on to make that deficiency greater. It is hence evident that bad milking, in a herd of animals which were ever distinguished as good milkers, is not the necessary consequence of improvement in the animal in other respects. The consequence of the *manner* in which such improvement is pursued, which the writer considers to be the reasoning properly applicable to the case, which happily also admits of a satisfactory appeal to facts; and which is strictly justified in asserting that improved short-horns, inferior to the common for the grazier, may always be selected and bred with the most valuable dairy properties. Perhaps a more plentiful and steady milker than any dam of Mr. Berry's bull, whose portrait has been given, never sent to the pail, and few such carcasses of beef have been exhibited as he has rendered it requisite to only half feed her. The bull has an extraordinary disposition to carry flesh, and his calves are in the udders like miniature cows. In fact, all the bull's family are excellent for the pail, and the quickest possible feeders. The writer has seen many instances of the highest bred short-horns giving upwards of twenty gallons (wine measure) of milk night and morning; and it is certainly no great attention only is requisite, on the part of the breeder, to perpetuate the quality in any desirable extent. While on this subject, it is proper to observe, that the excessive quantities of milk obtained from the union of short-horns are seldom or ever obtained from the improved; and that a moderately good milker of the latter kind will be found to yield as much *butter* in the week as one of the former: the milk being unquestionably of a very superior quality; and, indeed, it was likely such should be the case, and that the artificial change in the animal economy, which leads

periments of several friends during the last seventeen years),
 portrait and a short account of a two-year old Durham and
 mine, lately slaughtered by Mr. William Daniel (of Aber-
 accompany it with a few brief statements of the advantages
 is system by several of my own personal friends.
 was the second cross, and was of a light grey colour. She
 res and 8lb. ; rough fat, 98lb. : she was allowed to be the
 beast of her age, in all points, ever seen in Abergavenny.
 calf about six weeks before Christmas ; was dried the 17th
 killed the 10th of June. She sold for 19*l.* 3*s.* 6*d.*

	lbs.
live weight, on the 8th of June, was .	1232
o, on the 17th January	840
ease in 140 days	392

re that strong prejudice and much incredulity existed on
 crossing, I courted the attention of all the respectable
 rs, and feeders in this neighbourhood. Many came to see
 out up, and repeatedly afterwards during the five months
 ; and they all concurred in saying she went on faster than
 had ever seen. She never had any oil-cake.

a many excellent beasts bred from *improved* short-horn
 horn cows : indeed, I never knew one of these bulls put to
 the produce was not superior to the dam ; but the cross
 te, and with which I am best acquainted, is that with the
 have uniformly remarked, that each succeeding cross was
 a proportionate improvement in size, quality of flesh, and
 en. In every instance they have shown themselves superior
 and to the pail till within six or eight weeks of calving ; and
 es have come under my own knowledge where they have
 since they first calved ; and so highly are they prized as
 friend of mine, who hired out dairies, informed me that the
 him nearly 2*l.* per cow per year more for the half and
 reds than they would give for cows of other breeds.

mine had about a dozen North Devon cows, small in size,
 ality, and from these he commenced, about twenty years
 with short-horn bulls. He has since invariably used those
 ach succeeding cross the stock have rapidly improved in
 and the only trace of the Devons which I could perceive

first prize. He was last year sold for 60 guineas, and is now cows at 1*l.* each.

‘ *Brynderry, near Abergavenny.*

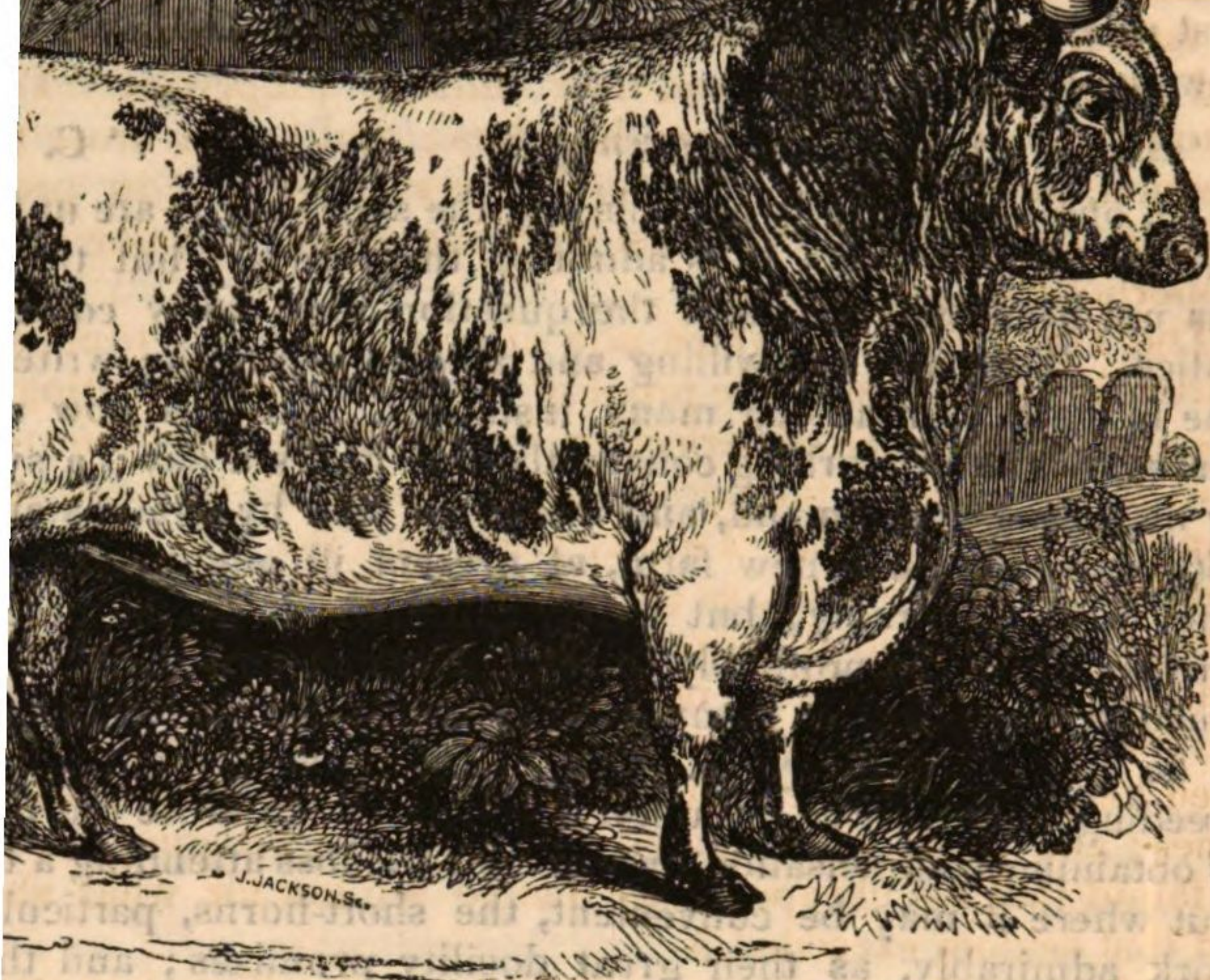
‘ C. H. Bo.

An opinion generally prevails that the short-horns are unfitted for work, and in some respects it is admitted they are so: but the correction has not been assigned, and the question may fairly come briefly under notice. That they are willing and able to work, the writer knows from one in particular among many instances. He has now a team of four years-old steers, working constantly nine hours a day; a system which by no means recommends, and forced on him by circumstances connected with entrance on a new farm, at present ill adapted to grazing. They work admirably; but surely cattle which, as the preceding chapter proves, will go as profitably to the butcher at two years old as a long-breed at three, and as many even at four, ought never, as a general rule, to be placed in the yoke. No beast, in the present advanced state of breeding, ought to be put upon a system which arose out of the necessity of obtaining compensation by work for the loss attending a tardy maturity. But where it may be convenient, the short-horns, particularly the females, work admirably, as their great docility promises; and there are many operations going on in every farm which a bull would be judiciously employed in performing. And as the bulls of this breed are apt to become useless, from acquiring too much flesh in a state of confinement, moderate work might, in most cases, prove beneficial for such as are intended for use at home.

As was before observed, the specimens which accompany this chapter will render little comment necessary on their form. With deference, however, it is submitted to the breeders of short-horns that they should avoid breeding from too close affinities, and, while they steer clear of coarseness, should require a sufficiency of *masculine* character in their males. The portrait of Lord Althorp's bull *Firby* evinces this requisite in a high degree. He has also—but, indeed, it is only part of the other; for without it good masculine character cannot exist—an excellent loin

* Lord Althorp first adopted the short-horns in 1818, when he purchased *Regent* at Mr. R. Colling's sale, with several of that gentleman's cows; and from that time his lordship has been unremitting in his attempts to improve the breed. *Firby* is good in almost every point. His flanks, loins, hips, and bosom are well formed. His only failing is in the crop; yet we are told by his lordship's very intelligent physician (Mr. Hall), and we had proof of the accuracy of the observation, when we had the opportunity of looking over the Wiseton herd, that, after using him six years, very few of his descendants have inherited this imperfection.—*Edit.*

R



| *Lord Althorp's Bull.* |

of the improved short-horns are red or white, or a mixture combining in endless variety, and producing, very frequently, effect. The white, it is very probable, they obtained from s with the wild breed; and whenever this colour shows accompanied, more or less, with a red tinge on the extremity of distinctive character, also, of the wild cattle. No *pure improved* e found of any colours but those above named. There is a short-horn, prevailing particularly in Lincolnshire, denomi- quotations of the Smithfield markets 'Lincolns,' and gene- rices below those of any other cattle. These are frequently and white, blue, and dun; but they have no further affinity oved short-horns than as the latter have been referred to for ment, which has been accomplished to a considerable degree. cription of large, coarse short-horns, of these objectionable hey generally accompany a bad quality of flesh—prevails in midland counties. They are great consumers of food, gutty, ly low and bad in the loins, with excessively heavy shoulder- owners of this stock, however, are crossing with the im- but the dairy-farmers of Gloucestershire are so much alive

and were beginning to lose, their milking properties. This grand error of many modern breeders; and hence arose the expression, and founded on careful observation, that in proportion as the grazing properties of the beast were increased, its value for the proportionably diminished.

The Yorkshire cow, which now almost exclusively occupies the dairies, is an unanswerable proof of the possibility of uniting the qualities to a great degree of perfection, *but not at the same time*:—the qualities to each other, and at the periods when it suits the convenience of man that they should. Twenty years ago the Yorkshire cow compared with other breeds, as great a favourite in the London market as present. She yielded more milk, in proportion to the quantity consumed, than could be obtained from any other breed; but a dairyman had had her four or five years, she began to fall off, he dried her, and sold her. It took a long time to get much flesh on her bones; and when he calculated the expense of bringing her into the market he found that his cheapest way was to sell her for what she would fetch, and that seldom exceeded 5

By degrees, however, some of the more intelligent of the breed in this market began to find that, by cautiously adopting Mr. Berridge's principle of selection,—by finding out an improved short-horn bull, which was generally milkers, and crossing some of the old Yorkshire cows with him, and then going back to the pure blood—but still regarding the milking properties of the dam, and the usual tendency to possess the qualities in the offspring of the sire—they could at length obtain a breed that had lost little of the grazing properties of the new breed, and retained almost undiminished, the excellencies of the old breed for the pail. It has happened that many of the cows in the London dairies are specimens of the improved short-horn as can possibly be produced. They do not, perhaps, yield *quite* so much milk as the old ones, but what they yield is of better quality; and whether the dairyman keeps them a month, or a little longer,—and this is getting more and more the case of these people,—or whether he milks them for three or four years, soon as he dries them, they fatten as rapidly as the most celebrated improved breed. Mr. Parkinson gives an account of one which, after being milked to the 5th of April, was put to grass with others, and sold on the 5th of July, after 91 days' grazing, having made in that time 12s. a-day.



[*The Yorkshire Cow.*]

air specimen of one of these cows: the character of the Hol-
the Durham beautifully mingling. A milch cow, good for the
as she is wanted, and then quickly got into marketable condi-
have a long and rather small head; a large-headed cow will
n or yield much milk. The eye should be bright, yet with a
idness and quietness of expression; the chaps thin, and the
The neck should not be so thin as that which common
given to the milch cow. It may be thin towards the head;
soon begin to thicken, and especially when it approaches the
The dewlap should be small; the breast, if not so wide as in
ave an unusual disposition to fatten, yet very far from being
it should project before the legs; the chine, to a certain
y, and even inclining to fulness; the girth behind the
ould be deeper than it is usually found in the short-horn; the
spread out wide, so as to give as globular a form as possible
e, and each should project farther than the preceding one to
s, giving, if after all the milch cow must be a little wider
above, yet as much breadth as can possibly be afforded to the
le parts. She should be well formed across the hips and on
d with greater length there than the milker generally pos-
a little too short, not heavy. If she stands a little long on
must not be too long. The thighs somewhat thin, with a
icy to crookedness, or being sickle-hammed behind: the tail
upper part, but tapering below; and she should have a mel-
d little coarse hair. Common consent has given to her large
and although the subcutaneous or milk-vein has nothing to
udder, but conveys the blood from the fore part of the chest

of nearly equal size before and behind, or, if there is any should be broader and fuller before than behind*.

The quantity of milk given by some of these cows is very by no means uncommon for them, in the beginning of the yield 30 quarts a-day; there are rare instances of their having quarts; but the average measure may be estimated at 22 or 24. It is said that this milk does not yield a proportionate quantity and that, although these cows may be valuable where the sale is the prime object, they will not answer for the dairy.

That their milk does not contain the same proportionate quantity of butter as that from the long-horns, the Scotch cattle, or the short-horns, is probably true; but we have reason to believe that the difference is much exaggerated, and is more than compensated by the additional quantity of milk. At the first introduction of the improved breed, there was much opposition against them on this account was very great, and certain experiments were made, by the result of which it was made to appear that the Kyloe cow yielded double the quantity of butter that could be obtained from that of the improved short-horn. Two ounces were obtained from the milk of the Kyloe, and one from that of the short-horn.

This aroused the advocates of the new breed, and they instituted experiments, the result of which was much less to the disadvantage of the short-horns. Mr. Bailly gives an account of an experiment made by Walton, of Middleton.

He took from his dairy 6 cows promiscuously, and obtained the following quantity of butter from a quart of the milk of each of the

* There are some doggrel lines, which so well express the greater number of points of such a cow as we have been now describing, that we are tempted to quote them from the Farmer's Magazine:—

‘She’s long in her face, she’s fine in her horn,
She’ll quickly get fat without cake or corn;
She’s clean in her jaws, and full in her chine,
She’s heavy in flank, and wide in her loin.
She’s broad in her ribs, and long in her rump,
A straight and flat back, without ever a hump:
She’s wide in her hips, and calm in her eyes,
She’s fine in her shoulders, and thin in her thighs.
‘She’s light in her neck, and small in her tail,
She’s wide in her breast, and good at the pail,
She’s fine in her bone, and silky of skin—
She’s a grazier’s without, and a butcher’s within.

which, if not altogether unsuspected, was not sufficiently acted upon to improve as a dairy-cow as she got older. The cow, whose milk produced more than 3 oz. of butter, was six years or five were only two years old; at all events the experience that her milk was richer at six years old, than it had been, is a subject which deserves investigation.

This circumstance is somewhat connected with such an inquiry. And the long-horn cattle seem to care little about change of pasture; but the short-horn is not so easily reconciled to a new pasture. Her milk is not at first either so abundant or so good as it becomes.

It likewise existed, and perhaps does yet in the minds of some, against the larger improved short-horns. The breed generally consumes; and it was also supposed that, in proportion to the size of the cow, she was likely to run to flesh instead of yielding milk. Therefore a rather small cow was selected, and one that did not require many proofs of point.

There is a great difference in the quantity of food consumed by different kinds of cattle, cannot be doubted; and that the short-horns are the highest rank among the consumers of food is evident. We never could be persuaded that the difference of size in the breed made any material difference in the appetite, or the food consumed, when they stand side by side in the stall or the cow-house, and we have taught us the proper average quantity of food, the little one eats more, and the larger one seldom eats more, even when it is full. There are occasional differences in the consumption of different animals, but these arise far oftener from constitution, or from some unknown cause, than from difference of size. Experience, however, prove beyond the possibility of doubt, that the larger breed, and other circumstances being the same, yield the greatest quantity of milk.

It has also proved another thing,—that the good grazing points of a cow, even her being in fair store condition, do not necessarily interfere with her milking qualities. They prove that she has the disposition to give milk, but which will not be called into injurious exercise by the natural process of time, or designedly by us, she is dried. She yields as much milk as her unthrifty neighbour, and milk of equal quality, and at four, five, or six years old, might be pitted against the gloe, while we have the pledge that it will cost us little to give her to the butcher, when we have done with her as a milker. It is a principle that many of the London dairymen now act, when

was lame during six weeks, from a foul in the feet, which diminished the quantity of milk during that time; and the experiment was discontinued because there was not a sufficient supply of turnips, and the whole of the herd was rapidly diminishing. For the first fortnight after calving, she was allowed a little broken corn; and from that period to the commencement of the turnip-season, she lived entirely on cut clover, when it was necessary to shelter her from the heat. The pasture was by no means of a superior quality.

After such a record—and it is far from being a singular one—can be no doubt, to adopt the language of the reporter, ‘of the probability of raising a breed of milking short-horns, which will surpass every other breed of cattle in the kingdom.’ We may, perhaps, safely add, that it is that breed, and that it only requires a little care in the selection and crossing, to perpetuate it.

We will take a very rapid survey of the few counties now to be described, and in which the short-horns are the prevailing breed.

CUMBERLAND.

The native breed of Cumberland was a small long-horned breed, yielding a fair quantity of milk, and of good quality; answering well for the dairy, but not so profitable as grazing cattle. With these were mingled the Kyloes and the Galloways, both of them quicker fatteners than the old Cumberlands. They were generally bought in about October, and turned all the winter on the pastures out of which the fat cattle had just been sold—a little hay being allowed them, according to circumstances. They were kept about a twelvemonth, and paid very well.

The long-horns were most used for the dairy, and chiefly for the production of butter. They yielded from one to two firkins per annum, according to their goodness and size: the average produce was about 84 lb. Some of them would yield eight quarts of milk per day during the summer, and three or four pounds of butter per week. The Cumberland cheese was much used to be in considerable request. The cheese was an inferior article, and chiefly made of skimmed milk.

The short-horns were not slow in penetrating into Cumberland, and establishing themselves there. They were first used to cross the native and Scotch breeds, and sometimes with considerable success. Mr. Halton Castle, attempted a cross between the Kyloe cow and the short-horn bull. His object was to increase the quantity of milk, and to preserve its quality; and to gain that, which the short-horn used to imagine the short-horn was sadly deficient in, hardiness.

who is undoubted authority here, says, in his 'Rural Economy,' that, at the commencement of the eighteenth century black cattle were the only breed in this district. They present breed of the lowlands of Scotland, mostly horned, and *humbled*. To these succeeded the long-horned, or Craven, which, by degrees, spread over the whole of the northern counties. At that time the chief work of the farm was done by the horse had not yet quite superseded the slower, but perhaps more powerful ox; and many of the long-horns, until they began to be bred by the breeders in the midland counties, were deficient in several respects, while the use of them was exceedingly inconvenient, and dangerous, in the yoke.

At length, the long-horns in their turn gave way to the Holderness breed, and that, for a century past, has maintained its superiority, and will continue to do so.

Mr. Pennycuik gives a singular account of these cattle, when first introduced, that 'the Holderness breed were thin-quartered, too small, and too coarse before; large shoulders, coarse necks, and large flaps. This form being found disadvantageous to the carrying of the quantity of the coarser parts, and reducing the value of the prime pieces, the breeder endeavoured to enlarge the hind-quarters. Had he stopped when he had got to the happy medium, he might have brought a good work, but the fashion was set—cloddy bullocks. The first variety of this species of cattle, which was a thick, large-boned, coarse, clumsy animal; remarkable for its size, and with thick gummy thighs; always fleshy, but never tender, the flesh being of a bad quality. This, however, was not the worst; the enormous size of the buttocks of the calf was frequently fatal to the mother, and numbers of cows were annually lost in calving. These were stigmatized by the epithet "Dutch-buttocked," and they were the worst breed the Vale ever knew.'

But the breed, however, soon cured itself; and, by judicious crossings from the Holderness, and, soon afterwards, from the stock of the enterprising breeders on the banks of the Tees, the Yorkshire cow was brought to its present state of perfection, retaining, with little diminution, the properties of the Holderness, and the grazing ones of the improved breed. It is now, and being, in point of fact, what we have described in 1824. The old and comparatively unimproved breed is still to be found in the possession of most of the dairy farmers of this county, for the prejudice—and, as we have confessed, not an

It has been observed, that the cattle of this district have not of late so rapidly as in former times. There may be two reasons viz., that the system of breeding *in and in* has been pursued too far, and that the depreciation of the times has withdrawn landed proprietors from agricultural pursuits, and thus lessened competition which was the most powerful stimulus to exertion.

The average weight of cattle in this riding of Yorkshire varies with food and age of the animal. A steer, from $2\frac{1}{2}$ to 3 years old for the market, will usually weigh from 65 to 75 stones, improved and a heifer from 55 to 65 stones. The usual method of rearing them for the market is simple enough. The calf gets milk for two or three weeks, and after that, scalded skimmed milk, meal and oil-cake boiled in water, with hay and turnips, until the spring when they have sufficient produce to support him; he remains in them until the following winter, when he is either tied up or turned loose into a field, fed with straw and turnips until the ensuing May: he is then put once more into the pasture until winter, when he is brought into the yard as before, until nearly May-day, and now, approaching nearly fat enough for the butcher, three or four months' grass generally completes him. Both the improved and the unimproved are treated in the same way. Now, however, appears the essential difference between the breeds—the most forward of the unimproved are scarcely ready when the improved cattle are gone, and they are not so fat and pointy as the others.

Upon the clay-soil of Cleveland, and other parts of this district, grass-land is principally appropriated to the purposes of the dairy; the unimproved breed mostly prevails; but even there, the more intelligent of the farmers begin to see the propriety of a cross or two with Teeswater blood. The young cattle are principally sold in the neighbouring markets, and are forwarded to the possessors of extensive farms in Leicestershire and Northamptonshire.

A great proportion of the cows for the supply of the metropolis dairies come from the North Riding of Yorkshire. They are sent within a month or six weeks after calving, and either journey direct to London, or halt for a year or two in Bedfordshire, or some of the other counties, in order that they may not reach their ultimate destination until they are five or six years old.

Among the breeders of the pure short-horns in this Riding, Mr. Bower, of Welham, deserves honourable mention. His name

of the long-horns, we find both the large and the small variety breed in tolerable perfection, but perhaps not so much so as in Lancashire. Even here, the short-horns have penetrated and are increasing.

EAST RIDING.

The short-horns prevail universally through this riding, except among the cottagers and little farmers, who still obstinately cling to several different varieties of half-horns. It is decidedly a breeding country; a great number of cows are yearly sent from it to Lincolnshire prepared for the London dairies; yet many oxen and sheep are brought from the Wolds to the fortnightly and weekly markets in Yorkshire, and pastured on the rich ground with which the country abounds*.

LINCOLNSHIRE.

Mr. Berry has disposed of the Lincolnshire cattle in a very judicious way, and we apprehend that no appeal can be made against his report. 'There is a large coarse short-horn prevailing, particularly in Lincolnshire, denominated in the quotations of the Smithfield markets "Lincolnshire short-horn," they have no further affinity with the improved short-horns than the latter have been referred to for their improvement, which has been accomplished to a considerable degree.' As, however, we have to travel

* In some part of this riding, as well as in the north of Lincolnshire, a society or club used to exist, and is still to be occasionally met with, called the 'Cow Club,' the principal rules of which we abridge from 'Strickland's Survey.'

'Each member shall, on the 12th of May and the 12th of November, pay one pound in the pound, on her value, for every cow that he insures, which sum when added to 20% shall be placed at interest, in order to accumulate for the benefit of the district. No cow shall be admitted without the approbation and valuation of one of the officers of the district, to whom, if required, she shall be sent for inspection.

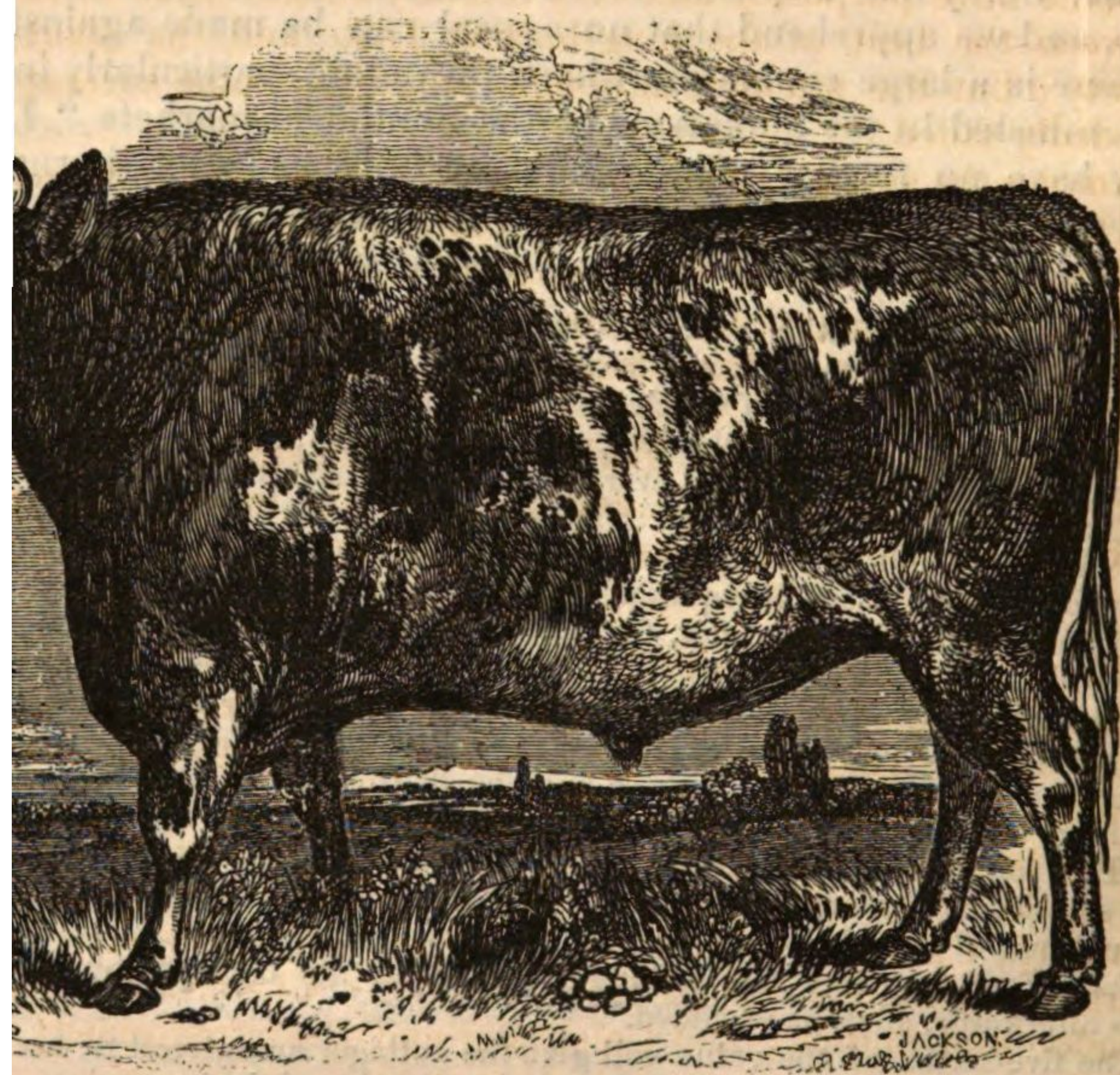
'Upon the death of any cow, the officer shall inquire into the manner of her death; if it appears to have been caused by wilful neglect, or by his refusing to employ a surgeon or veterinary surgeon, he shall receive no benefit; but for every cow dying without the neglect of the owner, there shall be paid five-sixths of her value; but no member shall receive any benefit from the institution upon the death of a cow more than fourteen years old.

'If, upon any accident, the officer of the district shall deem it necessary to have a cow slaughtered, the owner shall have the option of receiving the net value of the cow, the expense of slaughtering being deducted, or five-sixths of her estimated value from the books. Every member not making payment on the day appointed, or within ten days afterwards, shall be excluded.'

The five-sixths of the value will give the cottager an interest in her recovery, whereas if he was paid the whole value he might be careless.

but it is supposed that he confined himself to a selection
ive breed; and certainly he produced a valuable animal,
horn, cleaner in the bone, lighter in the dewlap, shorter in
the bosom, and round in the carcase. The breed was pro-
the 'Turnills,' and they yet remain in the hands of many
ey are handsome-looking beasts, always full of lean flesh;
er disposition than before to put some fat on that flesh, and
r ripe for the market.

th somewhat more judgment, called in the aid of the
d more speedily and effectually completed their object. They
e disposition to make lean beef only, although in very great
nd if they could not perfectly give to the Lincolns their own
y, they materially quickened the process of fattening. An
colnshire beast is therefore now a very valuable animal; and
n could be given to the meat, the greater quantity of muscle,
h that of fat, would be no disadvantage.



Lincolnshire Ox.

in the spring they are generally fed off before winter, many of them put up for stall-feeding, to which no breed is better adapted.'

The Lincolnshire cattle are principally red and white, but a breed was introduced, about the middle of the last century, by Sir Charles of Hanby Grange, and which have so much improved in size as to overtake the common breed of the county. They are found principally in the neighbourhood of Folkingham, and have been fed up to 1100 lb. at seven years old.

The extraordinary animal which was exhibited under the name of 'Lincolnshire ox,' although bred in that county, was an improved horn; and many of these are establishing themselves in every part of Lincolnshire.

Here, as in most other districts, there are great varieties of breeds which are said to be increasing, and even interfering with the native one, by means of the great annual importations of Irish cattle.

Some have purposely and very recently endeavoured to establish a cross between the best of the long-horned Irish and the short-horned of this county; but the attempt, although promising some success at first, has decidedly failed.

Among the small farmers, half-horns of every size and variety are common, and they are crossed in every way that caprice or folly can suggest. They are most of them good milkers. The Lincolns, although not so well adapted for grazing than for the dairy, yield more milk, and of a better quality, than some of the advocates for the old order of things are disposed to allow.

A great number of the Yorkshire cows destined for the metropolitan dairies halt in Lincolnshire, and many cattle from the north, and numerous herds of Irish beasts, are prepared for Smithfield market.

ESSEX.

There is no distinguishing breed in this county; but the chief agricultural business, so far as cattle are concerned, consists in the sale of calves and grazing in the marshes, with some attention to the improvement of the particular districts.

Our friend, Mr. May, veterinary surgeon, at Maldon, informs us that the suckling farmers procure their calves at the principal markets of Romford, Chelmsford, Maldon, Braintree, and Colchester. The London market is chiefly supplied from London; Chelmsford and Maldon from London and Suffolk; and Colchester and Braintree chiefly from the local dairies.

1. At some periods of the year these flats are covered with
of a small kind, and mostly the Welsh or Scotch runts; in-
zing is principally confined to these small cattle. A few
ever, in every part of Essex, apply themselves to the regular
ttle of a larger size. A few have the Devons, among whom
oned Lord Western, who is partial to these cattle, both to
the dairy. When they are grass-fed, there are always some
elsh runts as *trimmers*, i. e., to eat down what the larger
luable cattle leave. Many Herefords are prepared for the
ket in the same manner*.

business is confined to a comparatively small part of the
onsiderable quantity of butter is made in the neighbourhood
nd sent to the metropolis in small rolls; and it is deservedly
the peculiar sweetness of its taste. This depends not on
ow, for occasionally a dairy contains half a dozen different
ows, although the short-horns are the most prevalent, but
feed during the summer in the shrubby pastures of Epping
the leaves of the trees, and of numerous wild and aromatic
there abound, impart to it its peculiarly sweet flavour. The
wever, can seldom be certain that he has the real Epping
very fair imitation of it is sent up from Northamptonshire;
don retail-dealers wash the salt well out of the Cambridge
forming it into rolls, sell it for Epping butter; while a few
udent, and sell almost any kind of butter as true Epping.
o the dairy is another business, to which we shall have occa-
articularly to allude in another volume of our work, namely,
of pigs, and the preparation of sausages. The skim-milk
this purpose. Although the milk is always sour before it
roughs of the pigs, they thrive well, and their fat is firmer
ich is procured from others that are fed with pease or meal.
t, however, appear surprising, when it is known that all the
ciple of the milk, or that which would produce cheese, is

MIDDLESEX.

o distinct breed in this county, and a very small portion of
plied to the fattening of cattle for the butcher, for the pro-
procured in other ways can be sold at a much higher sum,
e, both large and small, are usually made fresh upon the marshes, and
hay, turnips, trangel-wurzel, and oil-cake.

more head of cattle.

Booth's establishment for the fattening of cattle will afford a sample of the rest. It is attached to their distillery at Brechin. The account of the building is chiefly taken from the Farmer's Magazine, an excellent agricultural publication, edited by Mr. Berry. 'The building is 210 feet long, and 180 wide. The side walls are about 10 feet high, and 20 windows on each side, and 8 windows at each end, which may be opened or shut at pleasure. It is lighted by glazed sky-light. The roof forms one ridge, and the centre part of it affords an ample hay-loft. It is supported by numerous cast-iron pillars, which, at the first entrance of the observer, have the appearance of a forest of columns. A passage of 6 feet in width extends the whole building, and between every two rows of cattle are passages of the same width. The whole is lighted at night by 36 gas-lights.

'The cattle stand in double stalls, $7\frac{1}{2}$ feet wide, and the space between the manger to the gutter behind the cattle is about 10 feet: the gutter has an inclination to one end, where are drains to carry off the dung from the gutters.

'There is a common manger, which extends the whole length of the building, and each row of cattle, the bottom of which is on a perfect level; but opposite to each beast is a second manger, placed in the first, and elevated four inches from the bottom of it, and being about a yard in length, into which are put the grains and other solid food, the common manger being for the reception of the wash, or any other liquid food.

'The wash is kept in a cistern or tank, above the level of these mangers, and in a different part of the premises; but pipes from this tank are conducted beneath the floor of the building, and communicate with the mangers by means of a distinct cock for each, so that by turning the cock, the liquid serves them, in a manner, for food and drink, as it contains the finer particles of the ground malt, and the greater part of the barley used in the mashing process.

'The grains are kept in pits, about 12 feet square, and 10 or 12 feet deep, somewhat narrower at the bottom than the top, and lined with cement. They are trodden in, and raised like the roof of a house, and covered with road-stuff, to exclude the air, and protect them from the weather. Little or no litter is used, and no green food or uncut straw is ever given. Oil-cake is seldom used, it being found that rough chaff, mixed with the grains and wash, will fatten to any extent.

visions.

in a note the number of cattle and sheep sold in Smithfield, from 1732 to 1830. It is taken from that most elaborate work, M'Culloch's Dictionary of Commerce*.

seen that the numbers of cattle slaughtered have been more during the century; but the inhabitants of the metropolis more than trebled since that time. Is less animal food consumed by each individual than at that time? Not so: but there is a fact connected with the agricultural interests of the kingdom, the numbers of the cattle slaughtered have increased, in order

Numbers of Cattle and Sheep sold in Smithfield in each year from 1732 to

Year.	Sheep.	Year.	Cattle.	Sheep.	Year.	Cattle.	Sheep.
1732..	514,700	1765..	81,630	537,000	1798..	107,470	753,010
1733..	555,050	1766..	75,534	574,790	1799..	122,986	834,400
1734..	566,910	1767..	77,324	626,170	1800..	125,073	842,210
1735..	590,970	1768..	79,360	642,910	1801..	134,546	760,560
1736..	587,420	1769..	82,131	642,910	1802..	126,389	743,470
1737..	607,330	1770..	86,890	649,090	1803..	117,551	787,430
1738..	589,470	1771..	93,537	631,860	1804..	113,019	903,940
1739..	568,980	1772..	89,503	609,540	1805..	125,043	912,410
1740..	501,020	1773..	90,133	609,740	1806..	120,250	858,570
1741..	536,180	1774..	90,419	585,290	1807..	134,326	924,030
1742..	503,260	1775..	93,581	623,950	1808..	144,042	1015,280
1743..	468,120	1776..	98,372	671,700	1809..	137,600	989,250
1744..	490,620	1777..	93,714	714,870	1810..	132,155	962,750
1745..	563,990	1778..	97,360	658,540	1811..	125,012	966,400
1746..	620,790	1779..	97,352	676,540	1812..	133,854	953,638
1747..	621,780	1780..	102,383	705,850	1813..	137,770	891,240
1748..	610,060	1781..	102,543	743,330	1814..	135,071	870,880
1749..	624,220	1782..	101,176	728,970	1815..	124,948	962,840
1750..	656,340	1783..	101,840	701,610	1816..	120,439	968,560
1751..	631,890	1784..	98,143	616,110	1817..	129,888	1044,710
1752..	642,100	1785..	99,074	641,470	1818..	138,047	963,250
1753..	648,440	1786..	92,270	665,910	1819..	135,226	949,900
1754..	631,350	1787..	94,946	668,570	1820..	132,933	947,990
1755..	647,100	1788..	92,829	679,100	1821..	129,125	1107,230
1756..	624,710	1789..	93,269	693,700	1822..	142,043	1340,160
1757..	574,960	1790..	103,708	749,660	1823..	149,552	1264,920
1758..	550,930	1791..	101,164	740,360	1824..	163,615	1239,720
1759..	582,260	1792..	107,348	760,859	1825..	156,985	1130,310
1760..	622,200	1793..	116,848	728,480	1826..	143,460	1270,530
1761..	666,010	1794..	109,448	719,420	1827..	138,363	1335,100
1762..	772,160	1795..	131,092	745,640	1828..	147,698	1288,460
1763..	653,110	1796..	117,152	758,840	1829..	158,313	1240,300
1764..	556,360	1797..	108,377	693,510	1830..	159,907	1287,070

weight of the bullock, 50 lbs. as that of sheep and lambs, and dead or net weight of calves, making a difference, as Mr. properly remarks, of nearer one-half than one-fourth.

The improvement of cattle has progressed with unsuspected since the middle of the last century: in many important points hardly be said to have commenced at that time. After consulting with several of the most intelligent butchers of the metropolis, I was induced to take 656 lbs. as the present average dead-weight of a calf (some butchers stated 85 stones Smithfield weight, none less than we have taken 82 stones). The average weight of the calf is now of the pig 96 lbs., and of the sheep and lamb 90 lbs., approaching double the weight of these animals in 1730. This renders the quantity of cattle slaughtered in the metropolis and the increasing number of inhabitants a little more proportionate.

We may now form some not very inaccurate idea of the amount of this branch of the provision trade in London:—

		Average weight.	No. of lbs.
Cattle . . .	159,907 . . .	.656 lbs. . . .	104,8
Sheep, &c. . .	1,287,070 . . .	90 „ . . .	115,8
Pigs . . .	254,672 . . .	96 „ . . .	24,4
Calves . . .	22,500 . . .	144 „ . . .	3,2

Number of pounds of meat consumed 248,4
 This, estimated at the average price of 6*d.*, would be 6,210,595
 At 8*d.* it would produce 8,268,293*l.* 9*s.* 4*d.*, exclusive of bacon, lard, and all salted provisions brought from a distance (the importation of bacon and hams into Great Britain is 500,000 cwt.), and also poultry.

This calculation will enable us to determine another curious question: what is the average quantity of meat consumed by each individual in the course of a year? If we divide the gross number of pounds 248,400,000 by 1,450,000, the estimated number of inhabitants in London and environs, the quotient will be 170, or each individual consumes half a pound of meat every day. This is a very high calculation compared with that of Paris, where each person is supposed to consume 100 pounds in the year; and Brussels, where 89 pounds form the allowance for each; but ours is a meat-eating population, and composed of Protestants; and when we remember that this includes the bones as well as the meat, half a pound per day is not too much to allow to each individual.

Cattle are sent from every part of the kingdom to Smithfield

st, and September, the grass-fed cattle begin to
are from the marshes of Essex, and therefore the
and midland districts rise to 5350, while those
decrease to 580. Some Leicesters, however, soon
kly follow; long droves from Northamptonshire
behind; and the northern cattle, in the preceding
5,340. In October, November, and the early part
-fed beasts still continue to occupy the market, and
ived from Leicester, Northamptonshire, &c.; while
marshes and the midland counties still partially kept
at 6400, and the Norfolks at 2380. The grass
d dependence begins to be placed on stall-feeding;
bserved at the outset, the northern cattle suddenly
rfolks rise to 16,000.

sonally little to do with the sale of his cattle, but
uce him to consign them to a salesman, who seldom
account. There is a law which prohibits him from
we fear that law is sometimes evaded. He is ac-
outchers and dealers of the district, and with the
t a glance what is the state of the market; he can
to rise or fall; and, comparing the lot which is
others, and with the market generally, he knows
ht to fetch. The salesmen are generally honour-
re for the owner the value of his cattle under all
e market; and although it may not always be so
ad expected, it is more than he could have got
ys sure of receiving his money.

s first appointed as the site of the periodical market
ation could possibly have been selected. It was
e city, it was a large uninclosed space, and would
e cattle that were sent there. There was plenty of
their being cruelly packed together, and there was
langer from driving them through the streets. In
er, the field was encroached upon, and partly built
was left for the accommodation of half the present
hose of only half the size of the improved breeds.
gan to surround the field on every side, and it was
to pass through the most crowded thoroughfares.
human life, and many an act of cruelty to the poor
but the most barbarous expedients were resorted to

two
being
drove
comm
endea
run b
with
geons
barba
gerou
centr
may c
heigh
more
the b
trils o
applie
"rings
chased
may be
rioratio
sum th
strike c
animal
years i
sleep i
in bea
a mat
person
he wil
order
behind
nose, a
so that
the catt
shall be
If the
and whe
they hav
beast out
stated, a
driven th
man is
cise this
time!"
'Anoth
scene:—
'"I ha
exercised
might be
bruises an

being set into the market in the daytime only, are consequently not in attendance. The drovers surround the unfortunate bullocks which cannot be tied up in the market, and commence by aiming with their bludgeons blows at their heads, to avoid which the animals endeavour to hide their heads, by keeping them towards the ground. On attempting to run backwards, the bullocks are restrained by blows upon their hocks and legs, with the application of goads; whilst, if they venture to lift up the head, a bludgeon is instantly hammering on it, until again lowered to the ground. The barbarity is continued until every bullock, however refractory, obstinate, stupid, or dangerous at first, has been disciplined to stand quietly in a ring—their heads towards the centre, their bodies diverging outward like the radii of a circle: this is done so that the cattle may conveniently be handled by the butchers. The barbarity of Smithfield is continued at night; but in the daytime, by seeing the process by which the cattle are driven more bullocks, when sold, are driven out of a "ring" or "off-drove,"—and the hammerings with bludgeons on the head; the thrusting the goads into the nostrils of the animals to make them move backwards, after similar instruments are applied to urge them in the contrary direction; by witnessing the mode of re-forming the "rings" or "off-droves," which are constantly broken through by the withdrawn animals, as well as by the passing and repassing of carts and drays, some idea may be formed of the amount of needless barbarity inflicted, and of the consequent deterioration of the meat. The deterioration of the meat has been calculated at a sum than 100,000% per annum, notwithstanding the care which the drovers take to strike chiefly where there is no flesh interposed between the skin and the bone; the animal feels most acutely, but there is no black mark to tell tales.—"I have lived many years in Smithfield," said a very intelligent witness, "and I find it perfectly impossible to sleep in the front of my house on the Sunday night. The cruelty practised upon the cattle in beating them into the 'rings,' no person can believe who has not seen it; and it is a matter very easily to be seen, I hope some of the committee (now sitting) will go and see personally. Supposing a salesman to have twenty beasts (which could not be more than he will have them all with their heads in and their tails out; they form a ring, in order to discipline them to stand in that manner, the drovers are obliged to go behind and knock them upon the noses. They strike them with great force on the nose, and goad them cruelly behind, by which means they form themselves into a ring, so that, at the period I speak of, there is a great deal of unnecessary cruelty. When the cattle will stand in that manner, so perfectly disciplined, that, at breakfast-time, there shall be twenty or thirty 'rings' of this kind standing in the middle of the market. If the 'ring' is broken by any means, they are all in the greatest anxiety to get back into it, and when the drovers are obliged to separate these 'rings,' and drive the cattle out, they have a great deal of trouble, and the labour of the men is excessive to get each beast out. Indeed, if you can conceive first getting the cattle into 'a ring,' as I have stated, and if one is sold out of the ring at eleven in the day, the beast is ordered to be driven through fifteen hundred cattle, whichever way he goes out of the market, the man is goading that beast all the way—if you can conceive men compelled to practise this cruelty, they will not be very delicate of the manner in which they use the time!"

'Another witness, who had been "a salesman about eight years," thus described the scene:—

' "I have stood behind eight of these off-droves, and the cruelty which is exercised to get them to stand properly is very great indeed, and which, by a little might be totally removed, and is the cause of the great complaint which exists of bruises and the wildness of the different animals when passing through the

tirely prevented, if there were room to tie each bullock sepa-

with this, an account of an undertaking of an opulent and
erkins, who, at the expense of 100,000*l.*, has erected a cattle-
at Islington, which will contain double the number of cattle
ld, and render the cruelties there practised in the packing
The building, so far as it has proceeded, was first thrown
public, on the 13th of September, 1833.

on an area of 22 acres, immediately abutting upon the Lower
ion is airy and healthy, and is peculiarly appropriate for the
road for the northern and eastern parts of the country,
of cattle for the London market comes. An immense
ralls, around which are erected a continuous range of slated
ic pillars, under which the cattle may at all times be pro-
the weather. These sheds are subdivided into numerous
closed by oak paling in front, to which the beasts may be
be at liberty, so as to be conveniently subject to the exami-
each lair there is a water-trough, constantly supplied with
s passing underground, from two immense tanks, which are
m capacious wells which have been sunk for the purpose.
heds is 830 feet, and they are capable of accommodating at
they may remain from one market-day to another, or till
venient for the purchasers to remove them—an advantage
hfield.

entre is divided into four quadrangles, intersected by wide
angles are to be erected sheep-pens (the materials for which
olding 40,000, so placed as to be approached with perfect
structed for calves, pigs, and such animals as are usually
e-market, upon an obviously simple classification, so as to
y of any sort.

salesmen and clerks of the market will be erected in a large
gress is obtained through a large arched passage under the
ial building, with appropriate offices on each side for check-
tion up stairs, either for the counting-houses of bankers, or
ith the business of the establishment. To the leads of this
, and from thence a full view of the whole market was ob-
ounding country; at once showing the perfect appropriateness
r of the site, which, in point of extent, is four times larger
and layers are all to be paved, if we may use the expression,
ainage is so contrived as to ensure perfect cleanliness in the

ne market it is intended to erect abattoirs for slaughtering
in which persons may either be accommodated with private
animals slaughtered under appointed inspectors at a certain
o that all the expense, inconvenience, and mischief arising
iving the cattle through the crowded streets on the market-

able-yard, stables, and sheds, capable of accommodating the
the market, is also to be erected, together with a range of
ings as are calculated to meet the wants of the various classes

with
York
Durh
body
cattl
poin
F
mie
whic
retu
T
ente
T
artic
the c
morn
it is
also
ing's
keep
it is
the
for
of t
grea
grea
is do
cated
T
able
butt
dem
of t
prof
the
is no
It
who n
in fac
opport

with very few exceptions, of the short-horn breed—the Holstein, Yorkshire cow, and almost invariably with a cross of the in Durham blood. The universal preference given to this breed by body of men, differing materially on many branches of the treatment of cattle, is perfectly satisfactory as to their value, and that on three points.

First, as to the quantity of milk. This we need not press, for the enemies of the short-horns have never contested this point. There is a cow which pays so well for what she consumes in the quantity of milk she returns.

This, however, is not all, though it may be the principal thing which enters into the calculation of the metropolitan dairymen.

The name of new milk has something very pleasant about it, but the article which rarely makes its appearance at the breakfast or tea of the citizen. That which is got from the cow at night is put by in the morning, and the cream skimmed off, and then a little water being added it is sold to the public as the morning's milk. The real morning's milk is also put by and skimmed, and, being warmed a little, is sold as the evening's milk. This is the practice of most or all of the little dairymen who keep their half a dozen cows; and if this were all, and with these cows it is nearly all, the public must not complain. the milk may be lowered by the warm water, but the lowering system is not carried to any great extent for there is a pride among them that their milk shall be better than that of the merchants on a yet smaller scale, who purchase the article from the great dairies; and so it generally is. The milk goes from the yard of the great dairy into the possession of the itinerant dealers perfectly pure. What is done with it afterwards, and to what degree it is lowered and adulterated, is known only to these retail merchants.

The proprietor of the large dairy is also a dealer in cream to a considerable extent among these people; he is also a great manufacturer of butter, for he must have milk enough to answer every demand, and the demand is exceedingly fluctuating; then it is necessary that the quality of the milk should be good, in order that he may turn the overplus to a profitable account, in the form of cream or butter. The employment of the short-horn cow, in all the dairies, is a convincing proof that she is not so poor as some have described it to be.

It is the practice in most of the dairies to fatten a cow as soon as she is dry, who may be drawn to the spot by their respective avocations. Every possible objection has in fact been foreseen; and, as the place is now open for inspection, the public has the opportunity of judging of its utility by personal observation.'

...milk.

...et-price of a good dairy cow is about 20*l.*, but the dairies have no little trouble to get a good cow. They will have a ready market for a considerable portion of the great cow-proprietors, and will probably give the poorer man would give; and therefore Messrs. or one or two others, have always the first selection. peculiar advantages for obtaining good cattle. In he has sheds that will contain five or six thousand portion of them halt on his premises for a day or two ght into the market. In addition to the shilling a es for their standing, he claims the milk of the cows he cows are milked by his people; he therefore quantity of milk which each will yield, and he is he very best of the herd. The dairymen do not like had her third or fourth calf, and is five or six years he greatest quantity of milk, and of the best quality. per day is the quantity which each cow is expected be retained in the dairy. Taking one cow with an- antity obtained is rather more than nine quarts.

...fail in her milk, she is fattened on oil-cake, grains, and disposed of. The dairyman calculates on getting er than when he first bought her, but sometimes he that seems to verify the old prejudice against cows le bought her for her known milking properties, but that he in a manner hides her in some corner of his , does her duty; she yields him plenty of milk, but ; and he is unable, try what he will, to get much and he sells her for less than half of her first price.

...lk yielded by all these cows, at 9 quarts per day, 00 quarts, or 27 quarts of genuine milk for each il dealers usually sell the milk for 4*d.* per quart, arated from it, and then obtain 3*s.* per quart for the great deal of water is mixed with this skimmed r underrate the price when we calculate that the 5*d.* per quart, which makes the money expended in metropolis amount to 985,500*l.* or nearly a million

...the 985,500*l.* by 12,000, (the number of cows,) we and almost incredible sum of more than 82*l.* as the

milk given to the hogs.

Rhodes's dairy has been established more than thirty years of the same family or name have lived in that neighbourhood century. 'Mr. Rhodes, farmer, near Islington,' is referred to by Brocklesby, in his treatise on the murrain which prevailed about the middle of the last century. The writer of 'London in the British Farmer's Magazine for February 1831, gives an account of it, of which the following is the substance:—The surface on which the buildings are placed is a gentle slope of two or three acres, sloping to the east. The sheds run in the direction of the slope, as well for the convenience of the gutters as for the supply of water for drinking, which will run from trough to trough the whole length of the shed. The sheds are twenty-four feet wide; the side-walls being about eight feet high, with rising shutters for ventilation, and panes of glass let into iron frames for light. The floor is nearly flat, with a gutter along the centre of each row of stalls, each seven feet and a half wide, along the sides, and a narrow gutter for two cows, which are attached by chains to a ring that runs along an upright rod in the corner of the stalls. A trough or manger, of a common size of those used for horses, is placed at the top of the stalls. The sides of these sheds are placed parallel and close to each other, and the party-walls are openings a foot wide, and four feet high, opposite to each cow. The bottom of these openings is about nine inches below the level of the upper surface of the troughs, and contains a one-foot square cistern, which contains the water for drinking; each cistern serves for two cows that are placed opposite to each other, but in different sheds. These cisterns are supplied from one large tank. These cisterns are covered with a wooden cover, which is put on while the cows are eating their food to prevent their drinking at that time, and tainting the water by putting any of the grains into it. At the upper end and at one corner of the quadruple range of sheds is the dairy, consisting of three rooms, each about twelve feet square; the outer, or measuring-room—the middle, or scalding-room, with a fire-place and a boiler—and the inner, or butter room.

At the lower end of the range is a square yard surrounded by a wall, some for fattening the cows when they have ceased to give milk, and others for store and breeding pigs. The pigs are kept to consume the casual stock of skim-milk which remains on hand, owing to fluctuations of the demand. The milk is kept in a well, walled with brick in cement, about six feet in diameter, and twelve feet deep.

ing morning. Mr. Rhodes's cows have always
sterns before them.

ive that, from the want of exercise, and consequent

Rhodes's cows may give a somewhat greater
aycock's; but on the other hand, when we think
corner of a stall for twelve, or eighteen, or twenty-
ve cannot help associating the idea of disease, or
least, with such an unnatural state of things;
stive system would particularly suffer, and we
vitation of all the secretions, and some dete-
of the milk. We should like to know the com-
of the animals in the two establishments. The
on would be strongly in favour of Mr. Laycock's

the cows in both of these, and in all the dairies
rains; and as the brewing seasons are chiefly in
stock of grains is generally laid in at those seasons

The grains are laid up in pits, lined with brick-
n ten to twenty feet deep, and of any convenient
trodden down, and covered with a layer of moist
es thick, to keep out the rain and frost in winter,

A cow consumes about a bushel of these grains
is from fourpence to fivepence, exclusive of car-

The grains are, if possible, thrown into the pit
ate of fermentation, and they soon turn sour, but
vorse by cattle on that account; and the air being
fermentation cannot run on to putrefaction. The
low and slight degree of fermentation which goes
development of the saccharine and nutritive prin-
ve as large a stock upon hand as they can afford,
ntil they are compelled. It is not uncommon for
re a pit of grains is touched; and it is said that
ars, and been perfectly good at the expiration of
ryman, however, must know his brewer, and be

The grains from a large ale brewery are the
se from the porter brewery are not so good; and
wers, who first draw off their ale, and afterwards
of nutriment in the formation of table beer, are

man
able
riorit
Bo
and
may
tenin
sim
cook
mon
wo
som

T
(the
milk
yiel
man
two
ing-
cons
has
dair
ficie
han
and

T
abun
mini
and
not
Sor
the
pol
nag
bet

T
dist
part

able price; and then the dairyman is driven to hay or chaff: the priority of chaff is now generally allowed.

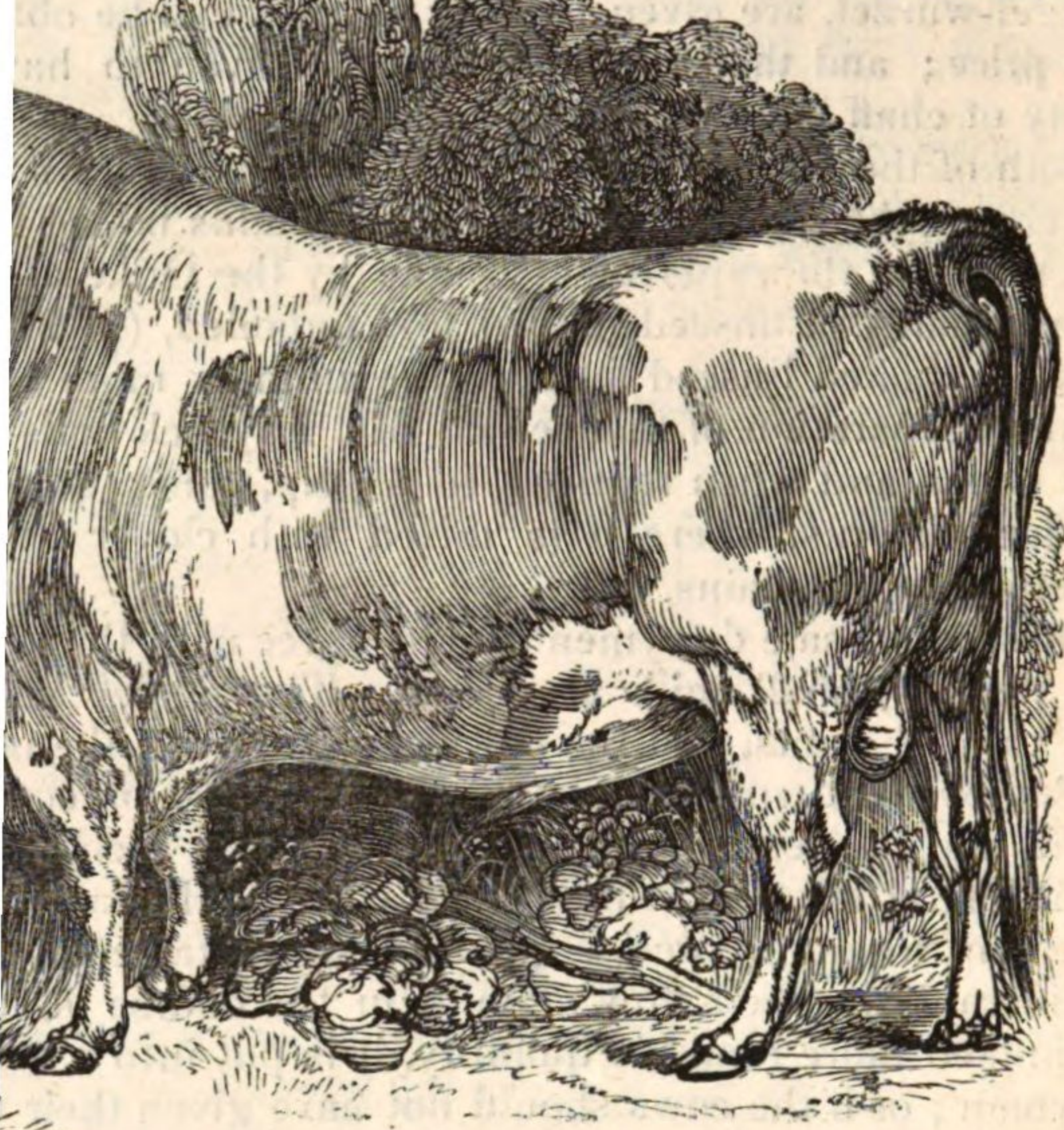
Both of these gentlemen fatten off their dry cows with grains, and clover-chaff, to which Mr. Laycock adds boiled linseed. Our countryman may recollect the experiments made by the Duke of Bedford on the fattening quality of linseed, boiled and unboiled, (p. 213), and in which the simple unboiled linseed fattened the animals more expeditiously than the cooked preparation of that seed. Mr. Laycock boils the linseed in an iron boiler, and when reduced to a pulp, conveys it by tubes into wooden cisterns, where it is mixed with clover chaff roughly, and sometimes with grains.

These wholesale dairymen usually agree with the retail dealers, that the dealers shall milk the cows. The dealer knows the quality of milk that he wants, and the dairyman knowing the usual quantity yielded by each cow, calculates what number of cows will meet the demand, and the retail dealer attends at three o'clock in the morning and two in the afternoon, to milk these cows. He carries it into the milking-room, where its precise quantity is ascertained. If, as cows often do, a cow has considerably in their flow of milk in the course of two or three days, and has milked more than his quantity, it is put into a vessel belonging to the dairyman; or if the cows should not have given their usual supply, a deficiency is made up from the dairyman's vessel. The milk which is in hand is put into shallow vessels, the cream skimmed and made into butter, and the skimmed-milk thrown into the pit for the hogs.

The Joint-Stock dairies, which a few years ago sprung up in great abundance, have either ceased to exist, or the number of cows, diminished, have fallen into private hands. While there were many joint-stock dairies, and the business was controlled by a committee of persons who knew nothing at all about the matter, they all proved to be lamentable failures. Some of them, even in the hands of private individuals, who brought them little or no experience, were sadly ruinous concerns. The Metropolitan Dairy was a striking illustration of this; but now, under the management of those who have been drilled into the business, it is much better.

SURREY.

This county, like Essex and Middlesex, cannot be said to have a distinguishing breed. The short-horns undoubtedly prevail; but in the parts bordering on Sussex, the valuable breed of that county is found.



[*The Alderney Bull.*]

ALDERNEY CATTLE.

—and a regular importation of which is kept up,—we
r, or Alderney cattle. The Normandy cattle are im-
ench continent, and are larger and have a superior
the others are from the islands on the French coast ;
ther from the continent or the islands, pass under the
derneys.

hire, they are found only in gentlemen's parks and
d they maintain their occupancy there partly on ac-
of their milk, and the great quantity of butter which
from the diminutive size of the animals. Their real
er on these accounts ; and it is thought fashionable
the breakfast or drawing room of the house should
cow or two grazing at a little distance.



[*The Alderney Cow.*]

John Lawrence describes them as 'light-red, yellow, dun coloured; short, wild-horned, deer-necked, thin and small-boned, but often very awkwardly shaped.'

Mr. Parkinson, who seems to have a determined prejudice against them, says that 'their size is small, and they are of as bad a form as can possibly be described; the bellies of many of them are four-fifths of the weight: the neck is very thin and hollow; the shoulder stands out as the highest part: they are hollow and narrow behind the shoulder; the chine is nearly without flesh; the hucks are narrow and sharp at the ends,—the rump is short, and they are narrow and light in the loins. This is about as bad a form as can possibly be described, and the description is very little exaggerated, when the animal is analysed point by point. All these defects are so put together, as to make a not unpleasing picture of a creature that is almost worthless for any purpose but that of eating.'

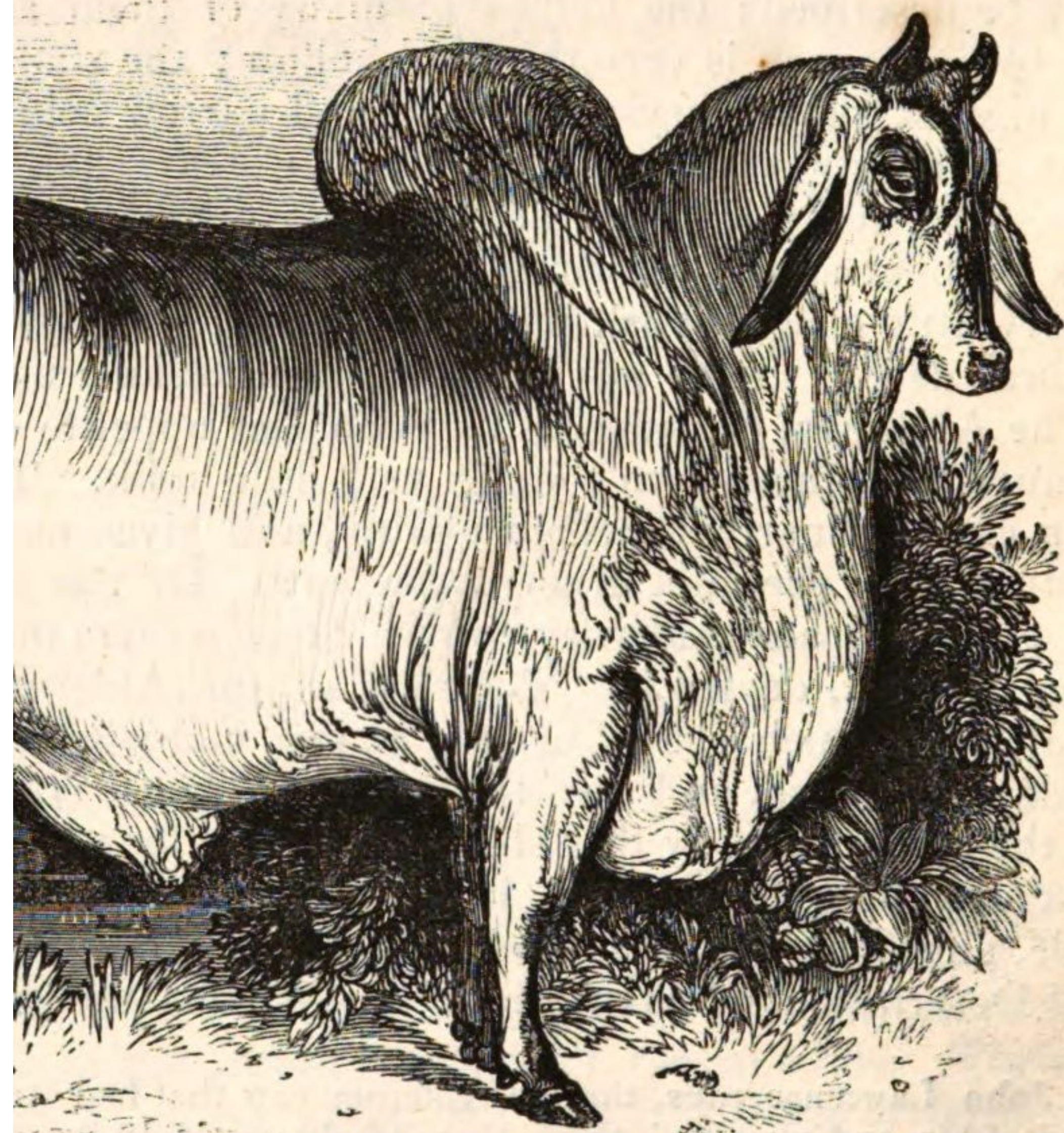
The Alderney, considering its voracious appetite—for it devours as much as a short-horn—yields very little milk. That milk, however, is of an extraordinarily excellent quality, and gives more butter than can be obtained from the milk of any other cow. Of this no one can doubt who has possessed any Alderney cows. Some writers on agriculture have, however, denied it. The milk of the Alderney cow fits her situation in which she is usually placed, and where the excellent quality of the article is regarded, and not the expense: but it is not rich enough, considering the small quantity that she does, to pay for what she costs*. On the coast of Hampshire, there is great facility in obtaining the milk of these cattle, and they are great favourites there. We must refer our readers to the 'Description of Hampshire,' p. 215, for the manner in which they are managed.

* John Lawrence says, that an Alderney cow that had strayed on the property of a friend of his, and remained there three weeks, made 19 lbs. of butter each week. The fact was held so extraordinary, as to be thought worthy of a memorandum in the parish books.

NAGORE CATTLE.

re exhibited at the Christmas cattle show, in 1832,
on of Nagore cattle. They were beautiful animals,
tention. They were the property of Henry Perkins,
near Wandsworth, to whom we are indebted for the
ving account of them.

Lieutenant-Colonel Skinner, at his farm at Danah,
rds of the Bichaneer desert, 100 miles to the west-
are not buffaloes, but of the highest breed of Indian
in India by the higher orders, to draw their state
h valued for their size, speed, and endurance, and
s. These specimens arrived at Calcutta, a distance



[*The Nagore Bull.*]

The
ployed
fore-h
harro
very
upon
other

H
bran
with
very
to c
wal

H
dow
and
their

M
Brab
of w

T
mor
Per
dan
unk
now

N
there
left
pecu

M
of a
the
then
men
was

The bull (Jupiter) was in high condition when exhibited. It is employed in a light cart, in various jobs about the farm: sometimes fore-horse in the waggon-team, to deliver corn; he also drags the harrow, and draws the light roller over the ploughed land. He is very docile and tractable, when one man drives him, and will lie upon him, but he has, now and then, shown symptoms of disobedience to others.

He is fed entirely on hay. Except that when he works, bran is given to him, and in the turnip-season he is treated occasionally with a few slices of Swedes, of which he is very fond. He was very troublesome to shoe; and it was necessary to erect a break to confine him. He was unwilling to go into it for some time, but now walks in very contentedly.

He is very fond of being noticed; and often, when he is laid down, if any one to whom he is accustomed goes and sits down upon him, and strokes him over the face, he will turn round, and put his head in their lap, and lie there contentedly as long as they please.

Mr. Perkins very properly observes, that the chief advantage of the Brahmin bulls would probably consist in their speed and strength, of which they surpass any of our breeds.

The cow (Iö) is at grass with the milch cows, and comes up with them in the morning and evening, when they are driven to be milked; but Mr. Perkins has not ventured to have her milked, on account of the danger of the attempt: the value of these cattle for the pail is therefore unknown. Two calves have been bred from them, and a milch cow is now in calf by the bull.

Neither of the calves is yet old enough, or ready, for the butcher; therefore the quality of the meat is unknown; but, a strong perfume is left upon the hand when it is passed over them, there may possibly be a peculiar taint in the meat.

BUFFALO AND INDIAN CATTLE.

Mr. C. Winn, of Nostal, near Wakefield, has some cattle, the result of a zebra bull and a Brahmin cow. They breed once in the year, and the calf is suffered to run with the mother as long as it pleases. The calves have been castrated, but with little development of form or improvement of meat. When fattened, they weigh from 25 to 30 stone. One was killed, weighing more than 35 stones, imperial weight. The

attempt has been made to handle them. During storm in winter, they have a hovel to run into; and seem to bear the cold climate so well as one of their es, they are usually very healthy.

re dropped, the mother endeavours to secrete them for a few days, like other wild cattle, so that the h the place, and a favourable opportunity, to castrate

ziers; the young ones getting into excellent condition and although they evidently lose flesh in the winter, are killed in the fall of the year, when four or five y good beef. The meat is finely marbled, and well-

k, the principal seat of Earl Fitzwilliam, there is a dian cattle. They were presented to Lord Rocking- y years ago, by Mr. Verelst, who was at that time

They have been occasionally killed for the table, peculiar sweetish taste, not pleasant to every palate. of the calves were castrated, in order to see how they zing cattle; they are not yet old enough to kill, but thrive so well as those that were left in their natural are driven into a yard with sheds; for they would pen ground. No cross has been attempted between of the country, from an impression on the mind of hat it would be more a matter of zoological curiosity y

HA
son
and
con
sat
of
dep
trea
is a
men
of t
effe
pu
un
any
and
exc
be
V
out
ter
qu
tio
de
wi
pu
H

CHAPTER IX.

THE STRUCTURE AND DISEASES OF THE HEAD OF THE

HAVING described the various breeds of cattle, and touched incidentally some of the principles of breeding, the method of rearing young, and the general management of the ox, we are prepared to enter into a consideration of his structure. This will afford us opportunity of satisfactorily elucidating the peculiarities, or *points*, on the development of which the excellence of the beast, for certain purposes, is supposed to depend; and will also enable us to understand the nature and treatment of the diseases to which neat cattle are subject. The subject is an important but disputed topic: it has been founded too much on mere assertion; it has varied with the caprice of individuals, or the fashion of the day; and it has rarely been referred to principle, and to the effect of certain conformations on the capacity of the animal for various purposes: the latter, more important still, has been altogether neglected until lately there did not exist, in the English language, and so far as any other, a scientific and satisfactory account of the nature and treatment, and cure of the maladies of neat cattle; but these animals were, in many instances, exceptions, abandoned to the tender mercies of those whose practice may be characterized as a compound of ignorance and brutality.

We should have endeavoured to make this part of our work perfect, without reference to any other; but having, in our treatise on 'the Horse,' entered into a laboured description of the different parts of the frame of the quadruped, we shall avoid repetition, by occasional reference to the corresponding parts of the Farmer's Series: and shall be enabled to make our account as brief as a clear understanding of the medical treatment will admit, and consisting of that only which is peculiar to cattle. For the purpose of future reference, and in conformity with the treatise on 'the Horse,' we first introduce the skeleton of the ox.



[*Skeleton of the Ox.*]

- | | |
|-----------------------|---|
| e. | x, The eight true ribs. |
| bone of the nose. | y, The false ribs, with their cartilages. |
| e. | z, The sternum. |
| k-bone. | 1, The scapula, or shoulder-blade. |
| or bone of the fore- | 2, The humerus, or lower bone of the |
| | shoulder. |
| processes or continu- | 3, The radius, or principal bone of the |
| tal. | arm. |
| . | 4, The ulna, its upper part forming the |
| ow in the temporal | elbow. |
| | 5, The small bones of the knee. |
| e, deeply depressed | 6, The large metacarpal or shank-bone |
| ridge of the head. | 7, The smaller or splint-bone. |
| | 8, The sessamoid bones. |
| on the lower jaw | 9, The bifurcation at the pasterns, and |
| | the two larger pasterns to each foot. |
| the neck, and its | 10, The two smaller pasterns to each |
| | foot. |
| | 11, The two coffin-bones to each foot. |
| | 12, The navicular bones. |
| | 13, The thigh-bone. |
| e. | 14, The patella, or bone of the knee. |
| nes of the neck. | 15, The tibia, or proper leg-bone. |
| ack. | 16, The point of the hock. |
| ins. | 17, 17, The small bones of the hock. |
| | 18, 18, The metatarsals, or larger bones |
| ail. | of the hind leg. |
| nd pelvis. | 19, 19, The pasterns and feet. |

ox may be divided, like that of the horse, into two
the face. The following cut represents a section of



a

b

c

d

e

f

g

h

i

T

tect

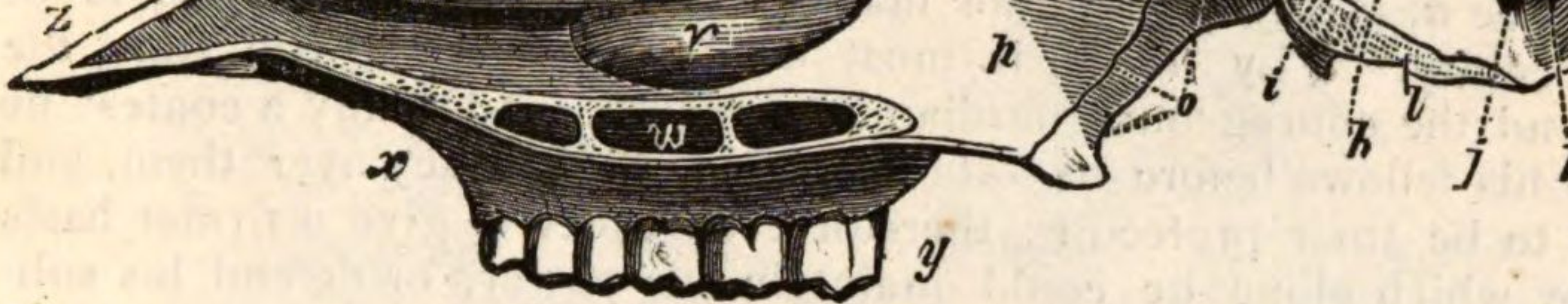
p. 2

one

p. 2

T

prin



[Section of the Head of the Ox.]

- a The horn, showing it to be a process of the frontal bone, and the manner in which it is hollowed.
- b, The frontal bone.
- c, The frontal sinus, extending from the nasal bone almost to the tip of the horn and the great foramen.
- d, The condyloid process of the occipital bone, and the foramen, through which the spinal cord passes from the skull.
- e, The cavity of the skull.
- f, The petrous portion of the temporal bone appearing in the cavity of the skull.
- g, The passage to the internal part of the ear.
- h, The foramen lacerum, or irregular foramen, through which several of the nerves escape from the space, and some of the blood-vessels enter.
- i, The foramen ovale—oval foramen.
- j, The anterior condyloid foramen.
- k, The posterior do.
- l, The basilar process of the occipital bone.
- m, The sphenoid bone.
- n, The crista galli of the ethmoid bone.
- o, The pterigoid bone.
- p, The perpendicular portion of the palatine bone.
- q, The nasal bone.
- r, The ethmoid bone.
- s, The superior turbinated bone.
- t, The inferior turbinated bone.
- u, The lower cell of the ethmoid bone, large in the ox as to be termed some the middle turbinated bone.
- v, The maxillary sinus.
- w, The cells of the palatine bone.
- x, The superior maxillary bone, and its palatine process.
- y, The grinders.
- z, The anterior maxillary bone, and its incisor teeth.

The cranium or skull, that portion of the head which contains and protects the brain, is composed of eight bones: two frontals, *e*, p. 272, p. 273; one parietal, *h*, p. 272; two temporals, *g*, p. 272, and *f*, p. 273; one occipital, *i*, p. 272; and *d* and *l*, p. 273; one ethmoid, *n*, p. 273; and one sphenoid, *m*, p. 273.

The difference in the appearance of the head of the ox and the horse is principally caused by the different extent and form of the frontal bone.

horn springs, and it is in fact a continuation of the (273.) To the male animal this weapon seems to be by him it is most used: he is, in his wild state, the courageous guardian of the herd, and many a contest he has before he establishes his supremacy over them, and his protector: therefore, in order to give a firmer basis to the bone he could maintain his power, or defend his sub- of the bull is considerably shorter and broader than the ox. It is so in every breed.

The cow is distinguished by her small head, and lengthened snout; the bull (see cut, p. 129) has as broad and masculine a head as the cow; and the animal, whose portrait is there represented, is impatient of control to be safe. It was necessary to confine him, and even under confinement, he was a perfect lowing.

The breadth of forehead is not only characteristic of the bull, but it is regarded, and properly, as an essential point in a bull; here argues deficiency of constitutional power, and diminishes his value as a stock-getter; we do not recollect an example: and, on the other hand, we have rarely seen a cow with a broad forehead that had not, in other respects, the usual points of the feminine character—she was neither a good mother, nor did she often fatten kindly; there was in her whole form, and her very flesh was coarse when slaughtered.

As to the smallness of the head in the horse or mare, how- considered to be a point of beauty, is very questionable as to the temper and actual value of the animal; but we believe it is more generally assented to by breeders than this,—a head, tapering towards the muzzle, usually indicates a good feeder, and a good temper too.

For the next page, with a cut of the head of a bull, whose full portrait was given in page 242. With somewhat too narrow a muzzle, it is a good illustration of the character of a superior bull of the improved short-horn

In some species of hornless cattle, this notion of the proper bone, is carried to a greater extent. The expanse of bone wanted as a base for the horn, is not found; on the sides the bones begin to contract a little above the eyes, and form a comparatively narrow ridge at the summit of the head.

it v
Ho
nu
the
occ
viti
of t
sku
and
nus
the
wa
int
the
to
nos



[*Head of Firby—Lord Althorp's Bull.*]

THE FRONTAL SINUSES.

If this expanse of bone were solid, its weight would be enormous; it would fatigue and weigh the animal down. To obviate this, in the Horse (*b*, p. 68, 'Horse'), it is divided into two plates, separated by numerous vacuities, or cells; but, unlike the horse, these extend through the whole of the bone—nay, they penetrate even through the parietal and occipital bones. Hence it happens that the *frontal sinuses* (so these vacuities are called in cattle as well as in the horse) extend from the base of the eye to the very foramen through which the brain escapes the skull, nay, as we shall see presently, to the very tip of the horn (*c*, p. 273).

There is the same septum, or division, in the centre of the frontal sinuses as in the horse; but there is not the same perfect division at the nostrils. Commencing about half way up the nose, the septum is wanting at the lower part, and the two nostrils are, as it were, united into one; and the frontal sinuses communicating with the frontal cavity, the frontal with the nasal, there is one continuous cavity from the base of the skull to the tip of the horn, and from one muzzle to the other.

INFLAMMATION OF THE FRONTAL SINUSES.

The whole of this cavity is lined by a prolongation of the membrane of the nose, and when one part of it is inflamed, the whole is apt to be

veterinary surgeon does one of two things; he either
e root of the horn with a trephine, or he proceeds in a
a better way—he cuts off the horn at its root. More
as sometimes escaped from the orifice; and although
been any suppuration and throwing out of pus, yet
ll be materially relieved by the bleeding that neces-
an operation. The opening into the sinus which is
however, be speedily closed; or the stimulus of the
render the inflammation worse than it was before.
e vast extent of cavity from the communication be-
ions of the sinus, the ox occasionally suffers much
species of fly that creeps up the nose and lodges in
us. He is tortured much more than the sheep from
annoyance is sometimes so great as to be scarcely
phrenitis. This, however, does not often happen; for
ull are more the accidental than the natural and re-
these insects.

THE USE OF THESE SINUSES

ne skull are separated from each other at least an inch
t some parts more than double that distance (see cut,
see the design of this? The skull is the covering of the
s of offence in cattle spring from the skull, and they are
ble effect, and more about the skull than any other part.
le use their heads as weapons of offence, and sometimes
tremendous force. From the expanse of the forehead,
cannot be covered and defended by the yielding but
ance which the temporal muscle affords to the horse;
ntal bone were so solid as almost to resist the very pos-
yet if the brain lay immediately underneath it, the
ould result from the shock of their rude encounters
dangerous, and often fatal. Therefore the bones are di-
es, and separated as widely as possible from each other,
rietal crest, and the root of the horn, the shock is most
e are also inserted between the plates numerous little
or rather scales of bone, (see c, p. 273.) (for many of
like thinness,) which, by their number, give sufficient
r plate in all ordinary cases, and by their thinness and
elding resistance similar to that of the temporal muscle
capable of neutralizing almost any force. Thence it
e external plate is fractured, the inner one is seldom

ter surface than in the horse, and a surface, passing over which, exposed to much danger. There is provision made for this. A groove is formed, in which they run for a considerable distance and below, securely defended by the ridge of bone on either side. They have given off various branches, and are either so diminished that they are comparatively out of the reach of injury, or if on the other hand, whether of the nerve or the artery were injured, the nervous system and the blood would be supplied by other ramifications.

THE ARCH UNDER WHICH THE TEMPORAL MUSCLE PLAYS.

In the cut (p. 66, Horse), and better seen in the cut in the ruminant of that work, a strong process of the frontal bone goes to contribute to the formation of the *zygomatic arch* under which the head of the lower jaw moves and is defended; and not only the act of mastication is securely performed, but there is so much room for the play of the jaw that the animal is enabled to use his teeth as weapons of offence. In the ox the teeth are never weapons of offence; he may gore and gore upon his enemy, but he does not bite him: and his food is more thoroughly gathered in the first imperfect mastication, and still more thoroughly sleepily ground down in rumination; this arch therefore needs not to be so capacious and so strong. It is likewise, from its position and the general shape of the head, exempt from the violence and pressure to which in the horse it is exposed; and therefore the arch does not project like the other for the purpose of strength, and to give room for a mass of muscle that is not wanted, but the frontal bone does not enter into its composition at all. (See g and e, p. 272.)

THE HORNS.

The greatest difference between the frontals in the ox and the horse consists in their prolongation in the former, under the name of horns. The foetus of three months old has no horn; during the fourth month it begins to appear, and may be detected by a little irregularity of the frontal bone. This increases, and by the seventh month it is evident to the eye under the form of a distinct tubercle elevating the skin. It now forces its way through the cutis or true skin, which it has accumulated at the time of parturition; and, continuing to grow, it detaches the cuticle or scarf skin from the cutis, and carries it with it; and this gradually forming over it, forms the rudiment of the future horn or the covering of the bone. Beneath this cuticle the horn soon begins to form; b

ge half-bony tumour which had grown on a broken
off, and the blood flew out in a stream as large as
as only by the repeated application of large budding
, that he was able to arrest the bleeding.

FRACTURE OF THE HORN.

will often make too early use of their horns, and
ate encounters before it is determined who is master of
is way the horn occasionally gets fractured. If the
evidently broken, but the external covering is not dis-
e is necessary than to fit some splents to the part,
e well up, so that the fractured edges shall be kept
n with each other, and in a fortnight or three weeks

orny covering is torn off. If the bone is not fractured
ve the process to nature. Young beasts are parti-
s loss of the covering of the bone, from their violent
ther. There will be a great deal of hæmorrhage at
ngth ceases and leaves the bone covered by coagulated
rees hardens and forms a temporary case for the bone.
another process commences at the base of the bone.
stance is found there, of the nature of which we shall
and this begins rapidly to thicken and harden, and to
r of good horn; it then runs up the bone, displaces
ed blood as it grows, and, in a less time than would be
vers the bone completely, and, much resembles in ap-
arly as strong as, the original horn.

ter the horny covering has been torn off, the bone will
tured, but the parts are not perfectly separated from
ust be brought in exact apposition with each other,
and confined with splents, or sufficiently strong ban-
ween the divided edges of the bone will speedily take
l grow over, and there will be scarcely a vestige of

ot only is the horny covering torn off, but the bone is
er and perfectly separated. The bone will never be
gh nature will often attempt to do it, and a rude mis-
be formed, half bony and half cartilaginous. To
rn must be sawed off level below the fracture, and
the better, because it will be the sooner covered by a

Th
abou
as in
the
the
part
degr
A
plat
they
car
it w
trac
has
two
of th
a thi
crete
ceed
The
bas
gro
hor
whi
the
very
of c
beca
the

bee
the
at f
ceed
the
T

The horny covering is composed of albumen, with a little gelatin about half per cent. of phosphate of lime. The ingredients are as in the hoof of the horse, but there is rather more albumen with the superior hardness to the horn. There is very little earthy matter in the horn. It does not yield by calcination more than one three-hundredth part; in fact, everything is excluded that can impart to it the degree of brittleness.

After long maceration the horn has been resolved into lamellæ or plates; but no nerves or blood-vessels have been found in it, though they must exist there, or the process of nutrition and growth could not be carried on. The horn is exceedingly thin at its base, and appears as if it were a continuation of the cuticle. The most careful dissection does not trace any separation between them; but maceration has shown that it has proved that the cuticle and the covering of the bone of the horn are two distinct substances. As from the coronary ligament at the union of the foot of the horse, and which is connected with the cuticle, or as a thickened bulbous prolongation of it, the hoof, or a portion of it is secreted, so, in the ox, from a less distinct prolongation of the cuticle proceeds the covering of the bone of the horn, or at least the base of it. The rings at the base of the horn, and which gradually recede from the base, prove this: but the horn, like the hoof of the horse, thickens as it grows down, and this thickening, and in fact the greater portion of the horn, are derived from the vascular substance that surrounds the bone, which is fed by the innumerable vessels, that are interposed between the cuticle and the horn. This substance, dense, vascular, filamentous, reticulated, is very easily demonstrated by dissection; but there is not the same degree of connexion, or the mutual interposition of horny and sensible substance, because there is not the same stress upon them, viz., the whole of the weight of the horse to support.

RINGS OF THE HORN.

These rings, proving the first growth of the horn from the bone, have been considered as forming a criterion by which to determine the age of the ox. At three-years-old, the first distinct one is usually seen; at four-years-old two are seen, and so on, one being added on each succeeding year. Thence was deduced the rule, that if two were seen, the number of rings the age of the animal would be given.

These rings, however, are perfectly distinct in the cow only;

pendance to be placed upon it. It is a mere general
any exceptions.

certain instrument called a rasp, the use of which has
made many an arm ache a little before a large cattle
being can tell whether the ring farthest from the head
removed; or whether the second may not have fol-
f the rasp is fine and gently used, and a little dirt,
it, is rubbed over the part, there is nothing to tell
r too great smoothness of the horn thereabouts; and
viated by giving the whole of the horn a smooth and

We have never liked these pretty, small, smooth,
art had been at work no one could deny; and we were
to suspect that it was oftener employed in the removal
heightening of a beauty. Cattle-dealers are not so
erchants; but strange stories have been told of them.
pulous in describing this deception, because we shall
peak of a method of judging of the age of cattle,
n lead us astray.

FREE OF FEVER ESTIMATED BY THE HORN.

the horn at the base will afford us an explanation of
rier and the cowleech, when examining a sick beast,
of all, the root of the horn, and the tip of the ear.
d sense about this. If the temperature is natural in
that there is no great degree of fever; but if the ears
d, it shows that the blood is no longer circulating
essels, but congesting round some important organ
inflammation—and nothing can be more dangerous
gains from the horn an indication quite as important.
the horn at the base as being very thin; it is quite as
e or scarf skin, and it covers one of the most vascular
ody. No where else can the practitioner get so near
d, or to so great a quantity of it. He, therefore, puts
of the horn, assured that he shall there have the precise
blood, and thus be enabled to judge of the degree
constitutional disturbance. The horseman puts his
h of the horse for the same purpose; but he cannot
for the vascularity is less, and the covering is thicker.
ciples—the thinness of the horn and the vascularity
erness of the bone beneath—brutal drovers often aim

ing nature of the bone at an early age, that some miscreants said to have acquired the art, by means of heated irons, of giving any direction and form that they please. It has often been the peculiar turn of many beautiful horns is artificial. The practice may be followed now we will not pretend to say; but it is falling into disuse. The great improvement which has been made in all the breeds of cattle, and particularly the introduction of short-horns, who have little pretensions to beauty in this part, have attracted the attention of gentlemen and agriculturists to far more important improvements.

Barrow, in his travels into Southern Africa, tells us that this custom was not confined to Britain or to Europe, and probably had its origin in either of them; for oxen being used for the saddle draught, by the Naguamas and other tribes, and particularly, when ridden by ladies, great care was taken to select the handsomest for the purpose; and the horns of the young cattle were twisted into various and a variety of fantastic forms by means of heated irons.

THE HORNS THE DISTINGUISHING CHARACTER OF THE DIFFERENT BREEDS

In the preceding chapters, we have classed the different breeds of cattle according to the length of the horn, and we cannot have a better illustration than the following table. Under the table of the middle-horns, we have ranked all the native breeds of cattle, the Devons, the Sussex, the Herefords, the Welsh, the Shropshires, and some of the Irish. Of the origin of the long-horns we had some doubts, whether they were either derived from a particular district of Yorkshire, or whether they were of Irish extraction. The short-horns, now naturalized in England, and becoming as it were *the* British cattle, were originally foreigners. In the crosses between them, the horns seem to have followed a determined course; as long as the breed remains pure, our cattle may be increased or diminished in size, according to the whim of the farmer, or the nature of the soil—they may be changed in the proportion of the different parts accordingly as a judicious or injudicious selection has been made for certain purposes—they may be made to assume the character of the true grazing, or of the dairy cattle, but the horn remains the distinguishing badge of the breed.

In the present race of short-horns there is a great variety in the form of the horn. Some persons think this of little or no consequence, but we confess that we are not of that number. It sometimes tells tales long gone by or forgotten, and totally unsuspected; and we are not to be possible that they will indicate certain peculiarities, except

together scarcely weighing four pounds, yet they
inches in length, two feet in circumference at the
inches midway, towards the tip.'

However, is that of the Great Arnee. Captain Wil-
of the true Arnee buffaloes of Bengal, who pursued
elephant; and which, when killed, was more than
ee feet wide across the breast, and had horns five

Mr. Bruce gives a singular account of enormous
ained from the Abyssinian cattle. 'The animal
strous horns is a cow or bull, which would be
g size in England. This extraordinary size of
a disease that the cattle have in these countries, of
s probably derived from their pasture and climate.
s symptoms of this disorder, he is set apart in the
t grazing place, and never driven or molested from
alue lies then in his horns, for his body becomes
n proportion as the horns grow large; at the last
weight of his head is so great that he is unable to
or any space of time. The joints of his neck be-
so that it is not any longer in his power to lift his
on he dies, with scarcely flesh to cover his bones,
s are of the greatest value. I have seen horns that
as a common sized water-pail, such as they make
England *.'

INFLUENCE OF SEX ON THE HORNS.

Sex on the horn, we have proof every day; but it is
ic cattle in a manner different from all other rumi-
of the male, and when in his perfect state, that is
or adorned with branching honours: the castrated
s altogether, or wears a pair of diminutive size,
tion; while the female is generally hornless. On
is distinguished by a short, straight, comparatively
horn; while a weaker, but longer, handsomer, and
n adorns the head of the ox; and a still more deli-
eserved for the cow.

ASIONAL HORNS ON THE GALLOWAYS

variety of horn, is that which now and then hangs

* Bruce's Travels, vol. vi. p. 50.

Large cavities between the plates of the frontal bone are found in the polled as well as in the horned breed ; but they are not so deep as they extend beyond the frontals. This, however, varies much in different breeds of cattle.

COMPARISON BETWEEN THE HORNED AND HORNLESS BREEDS.

There was a time when this question was much, and somewhat, discussed. It was taken for granted, by those who brought a more theory than practical experience to the consideration of it, that the horns were not only useless things, but that they were an evil ; and one, whose name will ever rank high as a scientific authority, has scrupled not to say that, ‘ on a very moderate calculation, it has been found that the loss in farming stock, and also in the diminution of food, is very considerable from the production of horns and the consequent damages.’ The fact, however, has never yet been thoroughly determined, whether the Galloway, or the Kyloe, with his branching horns, is the most profitable grazing stock ; each has its zealous advocates, and each is excellent. But it has been determined, that during the reign of the Bakewellian stock, no cattle displayed such a propensity to fan long-horns ; and as the chest became deeper and more circular, and the aptitude to fatten developed itself, the horn lengthened. It has also been determined, that for grazing and milking properties, and particularly for early maturity, no cattle can vie with the short-horns.

The question was most warmly discussed by those who knew something about the matter ; the existence of horns, or the length of the horns, in themselves no connexion at all with grazing or with milking. The polled does not fatten the quicker because there are no horns to consume a portion of the nutriment, nor is he longer in getting into condition because his brows happen to be adorned by them. They are at least of no use, as they cost the breeder nothing ; they are useful for various purposes, as they bring so much clear gain to the manufacturer. The horned cattle may, however, be occasionally packed somewhat closer than the polled, and being destitute of the natural weapon of offence, they are less ferocious and more docile. But the ferocity of the horned beast is the effect of mismanagement than of natural disposition.

THE USES OF THE HORNS OF CATTLE.

We will conclude this account of the horns of cattle by an extract from Professor Babbage’s excellent treatise on Manufactures :—‘ A

is used by the makers of knife-handles and the similar purposes. 4th. The interior, or cone, of the in water. A large quantity of fat rises to the surface, and sold to the makers of yellow soap. 5th. The is a kind of glue, and is purchased by the cloth-

6th. The bony substance which remains behind, is sold to the farmers for manure. Besides these various different parts of the horn are applied, the chippings -making are sold to the farmer for manure, at about el. In the first year after they are spread over the relatively little effect, but during the next four or five considerable. The shavings which form the refuse of are of a much thinner texture. A few of them are es, and painted and used as toys, for they curl up alm of a warm hand; but the greater part of these manure, which, from their extremely thin and di- its full effect on the first crop.'

THE OTHER BONES OF THE SKULL.

rief in our account of the other bones of the skull, as ture is connected with them.

—We speak advisedly when we call it one bone; for there is no suture. In the Horse (vide pp. 66 and e forms the chief part of the roof of the skull. In t the smallest portion of it appears on the superior it is found at the back of it, usurping the place of the attachment to the muscles of the neck, and par- supporting ligament (*m*, p. 272). It, however, spreads the horn, giving it some support; and it unites e, with the temporal bone, and contributes to the

s.—These bones (*g*, p. 272 and 273) have no stress they are therefore small, deep in the temporal fossa, quamous suture. The most important difference is ficial cavity which receives the head of the lower cularly adapted to the lateral grinding motion of

—This bone is, in the ox, deprived of almost all its no crest, no tuberosity, and very small condyles for c; and even its base, although a little widened, is

particularly the olfactory nerve, or that of smell, are as developed; the deficiency is in the cineritious part—that part which is supposed to be connected with the intellectual principle. The medullary substance is that by which impressions made by sensible objects are conveyed to the brain, and received there, and the mind transmitted, and motion given to every part: the cineritious portion where the impressions are received, and registered, and upon, and made the means of intellectual improvement, and the mandates of the will proceed. Now the senses of the ox are as those of the horse; he sees as clearly, hears as quickly, and has a sense of smelling in greater perfection; but he has not half the intellect of the horse. He partly has it not, because he does not receive the education of the horse; but more, because nature, by diminishing the bulk of the cineritious portion of the brain, has deprived him of the power of much improvement. Yet the difference is in degree, and not in kind. We ventured to prove, in the second chapter of this work, that he has sufficient intellect to qualify him for the situation in which we have placed him, and to enable him to render us all the service that we justly require of him. We ventured to go farther than that, and to say that when education lent her aid, and too wide a field was not given him, an ox would display sagacity and docility for which the common opinion would not give him credit. Shall we somewhat enliven a dry work by adding one or two additional anecdotes to those already given?

THE INTELLIGENCE OF OXEN.

First—maternal affection, mixed with a process of reasoning:—An ox was walking through a field, when a cow ran towards him, and bellowed most piteously. For a moment he was alarmed, and the suspicion of madness occurred to him; but when she came near to him, and went back the way she had come, looking earnestly at him, he was reassured. He wondered, but passed on. Again she came close to him, looking anxiously at him, and then lowing, trotted away in the same direction. His curiosity was now roused, and he followed her. She led him to the farther end of the field, where her calf had fallen into the ditch, and was nearly drowned. He rescued the little animal, and the mother expressed her joy in many an awkward but expressive gambol.

Next—attachment to their keepers:—Two *biparies*, or carriers, laden with merchandise on the backs of buffaloes, were driving a load of these animals from Palamow to Chittrah. When they were about a few miles of the latter place, a tiger seized upon the man

e, illustrative of the reasoning faculty in these ani-
near Laggan, in Scotland, had a bull which grazed
e open meadows. As fences are scarcely known
s kept to watch lest the cattle should trespass on
ds and destroy the corn. The boy was fat and
n found asleep; he was of course chastised when-
ssed. Warned by this, he kept a long switch, and
n them with an unsparing hand, if they exceeded

have observed with concern the consequence of their
he had no horns, he used to strike the cows with his
hus punish them severely if any one crossed the
antime he set them a good example himself, never
e forbidden grounds, and placing himself before the
attitude if they approached it. At length, his ho-
ecame so obvious, that the boy was employed in
usiness, without fear of their misbehaviour in his

ne argument too far. The ox has but one-half the
rse, and not more than one-half of his intelligence;
other part of our series, that the horse has not one-
e bulk of brain of the dog, and certainly not one-
d fidelity: therefore the dog is our companion and
ur servant; the horse is employed in some of the
rtant departments of our service; while the ox occu-
-but he, nevertheless, is our servant, and has sufficient
he duties we require of him. The difference be-
est—the difference that pervades all nature—is in
nd. He is, therefore, not so despicable as many
d he deserves better treatment than he sometimes
some districts, where he is used for the plough and
re he displays stoutness and docility equal to any
eed, that no great degree of intellectual power is
have degraded him to a state in which he has little
beside his food, and the reproduction of the species.
s, and with better servants at our command, that is
ought to occupy; but if it were needed, he has in-
perior to this; he occasionally displays the germ of
and the knowledge of this should give us a kind-
n, and protect him from many an abuse.

heart must strongly beat, and the stomach and the intestines must constantly and actively at work, in order to furnish the requisite milk when living, and the expected abundance of flesh and fat signed to slaughter.

The ox, however, is, in a manner, exempt from labour. In the districts of our own country, in which he is employed on the road, his work, although not always light, is slow, and it is not compared with that of the horse. At the termination of this *medulla* (q, p. 68, 'Horse,') commences the spinal chord, whence proceed the nerves connected with the voluntary motions of the body. Now the *medulla oblongata* is proportionally larger in the ox than in the horse, for the reason we have just stated, the spinal cord is considerably smaller, because so much muscular power is not needed. To the anatomist, this is a most valuable proof how admirably each animal is adapted to his situation and destiny; and these comparisons are devoid of interest to any one who has been accustomed to the superficial view, and study of the works of nature.

THE EAR.

Two of the senses, hearing and sight, have their residence in the head, of them, therefore, we shall next speak.

In horned cattle, where the ears are often comparatively small on account of their situation, limited in their motions, and cannot be erect, they are little regarded. The bull has usually the small ear and the larger ear; and in some breeds, and particularly the black and white, the Kyloe bull more especially, it has much to do with the beauty of the head.

In polled cattle, the ear of a fair size but not too large, free from blemish and well-fringed, corresponds with the beautifully curled forehead, and is considered to be a point of some importance. The portrait of the son's Angus cow (p. 169) will illustrate our meaning; while the head and large ears of the Suffolk cow, (p. 176,) and even in the wild beast, the disproportionate length of the ears in the Ayrshire cow will show how much they can diminish the beauty of the animal. In the Ayrshire bull, however, (p. 129,) the ears are a great addition to the countenance. A large ear would be generally objected to, as a coarseness of form, and possibly of flesh. The only advantage of a large ear would be, that it might be better able to discharge one of its functions, and rather an unexpected one, to guard the eyes from injury. I cannot long observe an ox, without admiring the adroit use of his ears.

from the introduction of insects into the ear seldom
s, however, these organs are much exposed, pro-
cess, and deafness. Fomentations will afford the
relief or cure, with occasional washing out of the ear
soap and water, and the application of a weak solution
when inflammation remains, and of a still weaker solu-
tion when inflammation has subsided.

Inflammation of the ear is a somewhat rare disease in cattle. It
is the animal carrying his head a little on one side;
pain to the ear from the heat and tenderness of its base
swelling out, and a kind of immobility of the ear, resulting
in the animal suffers in moving it. Bleeding from the
artery, and fomentations applied to the part, will usu-
ally afterwards a lotion composed of a drachm of the ex-
tract of same quantity of laudanum added to four ounces of
spirit may be poured into the ear, and the ear gently
rotated so that the lotion shall find its way to every part of it.

It appears to be very much annoyed by an itching of
the skin a dry scurfiness will be found spreading over a
part of the skin of the inside of the ear. That which we
call 'healing ointment' will afford the most ready cure. A
little but well rubbed into the inside of the ear, until
evidently softened, and this must be repeated daily.
The ointment is thus composed:—melt together four pounds of
common resin; set them by to cool, and when they
are in one pound of calamine powder, rubbed down to a
possible fineness. In a very few instances a collec-
tion of matter between the cartilage and the inner skin of the
ear must be opened from end to end.

Anginous granulations spring up from the base of the
cartilage and must be cut down with the knife. A strong solution of the
ointment then be applied over the exposed surface, and an
ointment, afterwards used.

THE EYE.

The eye is of a quadrilateral shape in the ox, (*h*, p. 272,) and
is above, to defend it from the violence to which, from
being so much exposed, and below, in order to protect the
beginning of the canal through which the
tears flow from the eye to the nose. The orbit, and par-
ticularly the superciliary ridge, is very subject to fracture,

are covered with contusions, if that hour were not near which
them from the barbarity of man?

These tumours appear generally on some part of the external
of the orbit; they increase with greater or less rapidity; they ta
rection which may or may not interfere with vision; and occasion
bend towards the eye, and press upon it, and are sources of tort
blindness. If the tumour is on the upper part of the orbit, and
to be attached by a kind of pedicle, it may be sawn off, and
touched with the cautery; in other situations we shall generally
fined to the use, and often the ineffectual use, of external stimul
best is the cautery. We shall not perhaps dare to apply it direct
part, but there is a method by which we may obtain the advanta
very high degree of temperature without destroying the skin. A
to be prepared, somewhat hollowed, and rather larger than accu
contain the tumour in its hollow. A piece of bacon-rind, with a
the fat attached to it, is then to be cut to the shape of the tumour
as to cover it; and, being placed over it, the iron, heated nearly re
to be applied upon it, and firmly held there for the space of two
minutes, and afterwards more lightly applied until the rind is
burned. The object of this is to bring a degree of heat, far above
boiling water, but not so great as of red hot iron, to bear upon t
Oil will boil at about 600 degrees of Fahrenheit; the fat about the
heated to that degree which will probably be sufficient to rouse
sorbents, and induce them to take up the bone, without destroying
of the part; for we shall see presently that it is a tumour of a
character. This may be repeated two or three times, with interval
days. Should the tumour not diminish, nothing more can be do
these bony growths in cattle, arising from local injury, have ve
life in them, and soon degenerate into a state of caries.

Sometimes these tumours spring from the back of the orbit, p
by the injury or perforation of the bone there by the point of a fo
cure can be effected; but if the eye should become evidently pain
exhibit marks of intense inflammation, and then begin to protrud
is but one course to pursue, and that is to destroy the animal.

These external bony tumours frequently ulcerate, and the bone
carious. No possible good can be done here, and humanity and
require us to put a speedy termination to the sufferings of the ani

The eyes are placed more on the sides of the face than in the
for the ox, in a state of nature, being exposed to the attacks of f
animals, needs an extended field of vision in order that he may
U

to afford considerable protection to the eye; to supply it
re which is necessary to preserve its transparency; to
e light when diseased; and to droop over it, and permit
y the repose which nature requires. At the edge of each
tilage, to preserve their form, and to enable them to close
long these edges are numerous little openings, which pour
uid that defends them from the acrimony of the tears.

subject to a pustular eruption on the edges of the eye-
sometimes by great soreness, and considerable ulcera-
fiance to every application, except the mild nitrated
ry, and occasionally it does not yield even to that; yet,
of winter, it frequently disappears spontaneously. It
bit of body, and is often connected with mange; and
ans are taken, it will assuredly return in the following
of sulphur will be found useful; but if the animal is so
not to refuse one with a powder in it, a course of altera-
be most serviceable. The powder should consist of one
nineral, two of nitre, and four of sulphur; and should
of from half an ounce to an ounce every night, according
e of the beast.

elids are best removed by the scissors—the root being
d with the nitrate of silver.

same contrivance as the horse for cleansing the eye
stances. A flat piece of cartilage, of a semicircular
thin the corner of the eye. No muscular apparatus is
t when its use is required, the eye is drawn back by
le, and the mass of fat at the inner side of the eye is
d drives the haw before it over the eye. When the re-
ct, the fatty substance returns to its place, and again
w within the corner of the eye.

eye is more disposed to disease in the ox than in the
portion of fleshy substance towards the inner edge of the
caruncle, or small fleshy body, placed at the corner of
proper direction to the tears, take on inflammation
th the eye generally, or from some injury done to them-
e irritation of dust or gravel; they swell prodigiously,
otruded over the eye, and cannot return. Ulceration
pear, and a fungous growth springs up. Sometimes
s a kind of epizootic. I have seen more than a dozen
n with the caruncle on the bulb of the haw thus pro-

be cast; an assistant must keep open the eye with his fingers; needle, armed with strong silk, must be passed through the canals, by means of which the part may be drawn out as far as possible; with a pair of crooked scissors, the haw may be neatly dissected. If the ulceration has extended to any of the parts behind, or to the surrounding tissues, they also must be removed. Considerable blood will probably follow the operation, and some inflammation of the neighbouring parts; but they must be subdued by proper means. If a fungus sprout, it must be touched with the caustic; but there is little attending the operation.

The eyelids are more subject to disease in the ox than in any domestic animal. If any foreign body gets into the eye, and remains there, the eyelids never fail to partake of the irritation; they become hot and tender, and very much thickened. Sometimes they continue thickened after the inflammation of the eye has subsided. Fomentations will be indicated here. Occasionally there is considerable swelling of the eyelid, and especially where the pasture is marshy. These enlargements are too little thought of, and left to relieve; but they indicate a certain degree of general debility, and a disposition in the eyes to take on disease. We have seen many cattle whose eyelids were either distended with fluid infiltrated into the cellular texture, or from which a portion of the fluid had been removed by abstraction, but a deposit remained, indicated by the impression of the finger being left upon the lid. These cattle were always more or less in poor condition, or would not fatten kindly, or had lately had inflammation of the eyes, or were attacked by it soon afterwards.

A curious appearance—we can scarcely call it a disease—has been observed in the eyelids of fat bullocks. They have been emphatically called emphysematous. A certain portion of gas has been infiltrated into the cellular tissue. It is said that in France this has, now and then, been the consequence of the rogueseries of cattle-dealers. When there have been too many salient points, about the cattle, a perforation has been made in the skin, a little pipe introduced, and a quantum suff. of air blown into the cellular substance, a portion of which, by degrees, found its way to the eyelids. We do not believe that tricks like these are attempted, although we shall have to expose not a few of the dishonest practices of cattle-dealers. If this natural emphysema is supposed to be a dissight, a slight scarification may be made on the lid, and the gas gradually pressed out.

te. It has the same periodical character, and will disappear until it has its natural termination—blindness. The ophthalmia, however, proceeding from the introduction into the eyes, blows, or being the accompaniment of and then yielding to medical treatment, are more numerous in the horse, and therefore, as it is not always possible to distinguish the one from the other, the disease may be treated with confidence.

The cure are the same, bleeding and physic, as the constitution, and fomentations, cold lotions—opium, in the form of the dilute spirituous tincture—saturnine lotions—zinc applications; the opium during the acute stage, the lead as the inflammation begins to subside, and the zinc as the inflammation is nearly subdued. The chief difference in treatment is the necessity of having recourse to the tonic sooner for the ox than would be deemed prudent for the horse. The increased strength of the vascular system in the ox will cause inflammatory diseases speedily run their course in these animals, whether general or local, treads closely on the inflammation.

As the nature of the disease being once apparent, the proprietor is immediately informed of the state of the case, that he may at once remove the animal to the butcher, or hasten to prepare it for sale; and that cannot be too deeply impressed on the mind of the farmer. The ophthalmia is as certainly hereditary in cattle as it is in the horse.

OTHER DISEASES OF THE EYE.

A singular disease of the eye, which cannot properly be called ophthalmia, is sometimes epizootic among cattle, and sadly frightens the farmer when it first appears. Young cattle pasturing on wet and marshy ground are suddenly seized with swellings of the tongue and swellings about the membrane of the mouth. At the same time the eye becomes intensely inflamed, and superficial ulcers appear on the cornea. A cow-leech is sent for in haste, and he, thinking that desperate remedies, applies his caustic or his astringent to the eye, fuel to fire, the inflammation grows more intense, and the animal becomes blind. A little experience would have taught the farmer only one of nature's methods, a rather singular one, but a cure, and rid of something that offended the constitution; and that

useful for many purposes, a blind ox is good for nothing.
CANCER OF THE EYE, or a perfect change of the mechanism into a fleshy, half-decomposed substance that ulcerates and or from which fungous growths spring that can never be a disease of occasional occurrence. The remedy would be extirpation of the eye, if it were deemed worth while to attempt it.

A very curious disease of the eye has in a few instances been observed. The common symptoms of ophthalmia appear, as injection of the eye, dimness of the cornea, weeping, and swelling of the lids. These are attended to, but the inflammation increases; and, on very close examination, a small white worm, about the size of a hair and an inch long, is found swimming in the aqueous humour, or that fluid which is immediately behind the cornea. Now it is at once evident that the only way to get rid of, or to destroy this worm, is to puncture the cornea and draw it out; and this method has been resorted to. In some cases, many days pass before another worm makes its appearance, and a new operation is to be performed a second time, and the horse eventually becomes blind. A veterinary surgeon, Mr. Chaignaud, who seems to have much experience about this, says, that three or four days before the appearance of the worms, one or two minute bodies, of a reddish white colour, are seen at the bottom of the anterior chamber of the eye. He also says that the disease appears about June, and is not seen after December. Whether the malady has not fallen under our observation; but in British cattle, every disease, of which there is authentic record, may be described. There is no difficulty about these animalcules passing through the eye, for there are undisputed instances of their passing through the smallest capillaries, and being found in almost every tissue.

FRACTURE OF THE SKULL.

One class of the diseases of the head to which cattle are subject, fall under the title of compression of, or pressure upon, the brain. It is a curious fact, that portions of the external or cineritious part of the brain may be cut away without the animal being conscious of it. The slightest pressure cannot be made upon the brain without immediate loss of consciousness, or loss of the power of voluntary motion. An illustration of this occurred to a veterinary surgeon. Notwithstanding the protection which the divided plates of the frontal bones afford, the interposed elastic bony walls afford, the horn of a vicious bull sometimes does mischief. It had penetrated both plates in the case of a cow, but she was seen grazing as usual, with a greasy bloody

ielding piece of iron introduced, which, acting on the
ver, raises the depressed bone to its proper situation.
of the frontal, and the distance interposed between the
it impossible to use such an instrument with success
herefore the animal should always be consigned to

HYDATIDS AND TUMOURS IN THE BRAIN.

ject to a disease strangely termed **URNSICK**, in which
und and round in the same way as the cow with the
he cause of this peculiar motion has been satisfactorily
cule, called an hydatid, pressing upon the brain, and
ations have been had recourse to, in order to remove or

etimes exhibit the same symptoms. First, some degree
-she perhaps scarcely eats—**rumination** is suspended—
-the ears and roots of the horns hot—the breathing
hair rough. It is fever without any evident local
rhaps she is bled and physicked; but on the following
ns to speak for itself; she turns round and round, and
direction: it is pressure upon the brain; and, remember-
his sheep, the farmer at once despairs, for it is plain
ration can relieve such an animal from the hydatid.

ever, despair. It is evidently pressure on the brain,
of the hydatid the only one that can affect the brain, or
r motion? Would not effusion of blood, or of any fluid,
ribed portion of the brain, produce the same effect?
en a somewhat too great determination of blood to the
le vessel may have given way. It is worth trying for a
and the cow will not be much the worse for slaughter in
ould be bled again, and that copiously; and a stronger
ld be given. In some instances, perhaps we may be
in the majority of cases, the animal will do well.
diet at the time, and for a while afterwards, will be
Success will not, however, attend every case, and in
ch oftener than in Great Britain, cattle have hydatids

owever, peculiar to young cattle. It seldom attacks
is a year and a half old. Bartholin, an old writer,
a great many beasts perished from a species of frenzy,
were examined, vesicular worms were found in the

same manner that it is in sheep, by the softening of the bone at part ; because the frontal sinuses are not fully developed in young cattle. The hydatid may then be punctured with an awl in the corner of the eye, or better yet with the trephine ; but for own parts the chance of a permanent cure is so slight in *sheep*, that we should be inclined to think that the *young cattle* thus affected should be immediately destroyed.

WATER IN THE HEAD.

There is another species of pressure on the brain, to which very young cattle are confessedly subject, and that sometimes in the foetal state we mean HYDROCEPHALUS, or water in the head. The fluid is usually found between the membranes, and it exists in such a quantity, and enlarges the cranium to such a degree, that parturition is rendered difficult and dangerous ; and it is often necessary to deliver the progeny in order to save the life of the mother. There is no hesitation about this, for a calf with water in the head will not do for anything.

A calf was born with a large tumour on the frontal bone—it staggered as it walked—it was unable to raise its head to the teat, but it sucked heartily when it was held to the teat, and thrived. The tumour was punctured on the third day, and two thirds of a half of fluid escaped. The calf then walked of its own accord, and its mother, held up its head for the first time, and sucked its fill. For several days it seemed to be going on well—when a bloody pus began to flow from the wound—the animal refused to suck—tetanus supervened, and the calf died.

We have sometimes, yet not often, seen hydrocephalus at birth in very weakly calves ; but we do not recollect an instance of a healthy one ; and in almost every case it has been fatal : the animal indicating weakness, and rapidly undermining the powers of life. In such a case, prudence would immediately consign such an animal to a butch.

In the adult animal, the pressure of a serous fluid on the brain occasionally be a source of general disease, or death ; but it is not an accumulation of fluid in the ventricles of the brain, rather between the membranes, and not indicated by any change in the size of the skull. The symptoms will very much resemble those of the hydrocephalus which we are presently to describe, except that they are of a different character, and the malady is slower in its progress—and the plexus or network of minute arteries and veins in the ventricles, is considerably enlarged.

ad the beast been closely observed, it might have been was more than usually indisposed to move—that the ttle laborious, and the eye somewhat protruded; but s no notice of trifles like these. *The animal seems to nce*—he falls—he breathes heavily and stertorously— greater or less violence, and then dies—sometimes in ner after the expiration of a few hours.

to do anything, the beast should be bled, and as much ken away as can be got. A pound and a half of Epsom e given, and without any carminative; and this followed alf a pound until the physic operates; its action should ntained by six-ounce doses of sulphur every morning.

of blood in the vessels of the brain being removed, and n which, to a certain degree, prevails everywhere, the laughtered; for he is liable to a return of the complaint n would not, previous to his first attack, have in the fected him.

PHRENITIS

SOUGH in cattle is too well known to the farmer and the re is generally, at first, much oppression and heaviness; arcely be induced to move; the eyes are protruded and iration is hurried; and delirium, more or less intense,

The beast rushes at everything in its way; it mis- out objects; it is in incessant action, galloping about ed, staggering, falling, bellowing hideously; its skin os, and the sensibility of the spine strangely increased. health a peculiar formation of the eye of the ox, or a retina to certain colours, which makes the beast dislike object*; under this disease it raises him to the highest

ecdote, related by Sir Walter Scott, will illustrate this antipathy to etimes exhibit, and at the same time give the reader some idea of ularities and powers possessed by that great man. The story was two before his death.

chievous bull puts me in mind of a similar case, which I myself s ago in Edinburgh. I was proceeding from the old to the new mound, at the head of which I was led for a few minutes to look at to an inclosure there, after the unmerciful butcher-lads had driven rowd that gathered on the outside of the fence increased the brute's ey began to cast ropes over its horns and around its neck, thereby hold, that it might be slain in the place where it was, which drove e fury. Its eyes now glared madness; there were handfuls of foam

ther, over-driving, &c. In the neighbourhood of London, to stances of phrenitis occur from the latter cause. It once used sport of brutes in human shape to excite it, by selecting a bear herd, and driving it furiously from street to street.

As to the treatment of phrenitis there is some difficulty. Is it practicable? Is human life to be hazarded? Cases where which a bullet would be the best remedy; but then the flesh is in such a congested state that it cannot be sold. If the beast is manged or approached during a momentary remission of the fever, bleeding should be attempted, and if a vein can be opened, it should be suffered to bleed on as long as it will. Physic, if it can be given, is indicated. Sometimes the beast labours under an insatiable thirst. If his taste is not now very exquisite, he may be cheated with a decoction in which Epsom salts have been dissolved. If there is time to get him a hornful of drink, a scruple or half a dram of the farina of linseed nut may be administered, mixed with a little gruel. All other remedies are completely out of the question. If bleeding and physic will not save the ox, nothing will. Use should also be made of any opportunity of respite to confine the animal; or, if possible, to get him into

the air, flying from its mouth; with its fore feet it pawed the ground, throwing lumber high as the adjoining houses, and it bellowed so as to make one quake. It was not but an agreeable sight, so I moved away homewards. But before I got to the mound, an alarming shout caused me to look back, when I perceived the bull at a great distance behind me, coming on with all its rage. I had just time to get to the top of the wall that lined the footpath, and to behold its future progress.

‘I shudder to this hour when I think of what immediately I saw. Amongst those that were near me and in jeopardy, was a young lady, and, as you have seen, in a red mantle, which is a very offensive colour to many of the brute creation. She had also made for the wall, but had neither time nor strength to gain its top ere the animal drove towards her. She turned her back, however, to the inaccessible wall, as if to see the full extent of her fate, and then stood as nailed to it, save a hat which she threw aloft in her despair, which would have been as fragile as a rotten reed. Her tender body would have been nothing against a force that might have broken bars of brass, and horns that might have transfixed an animal of its kind. I have said, directly towards the unprotected young lady the bull drove. The first intentest eye he came on, he mistook his mark not an inch; for as the multitude of him yelled their horror, he dashed with prodigious strength and madness at the wall.

‘Was it not a miracle that the dear young woman escaped unhurt? Yet, it was true; for the terrific animal struck at her so accurately, that a wall as a dead wall on either hand, thus embracing, but from their great length protecting the person from even the slightest danger. But the staunch wall withstood the thrust, and sent back with rebounding force, to a great distance, the huge brute, throwing him prostrate, never to rise again; for numberless destructions were plunged into him, ere he had time to recover from the recoil.’

ding from the spinal chord are of two kinds, those by voluntary motion is conveyed to the limbs, and those impressions of surrounding objects are conveyed to the first of the diseases of the nerves of motion. There is conveyed from the brain, through the medium of the various parts of the body, and by means of which it is communicated. In a state of health, that influence is communicated by a succession of undulations, or pulses. In disease, it is communicated by a rapid and without interruption; if that is only partial and affects a single muscle, or one set of muscles, the animal is said to be affected with tetanus; if the stream of influence is rapid and uninterrupted action extends over the whole of the body, he has fits; and if the nervous influence is interrupted, there is palsy.

It is a frequent occurrence in cattle, but it is seldom that it is observed until the mischief is done. The animal is off its food, is disinclined to move, and stands with its head propped up by the dryness of the muzzle, or heat of the horn, or cold of the feet. Nothing is done. The next day the beast is found in the same position, scarcely moved, and the herdsman begins to be alarmed. He mentions the case to the owner. The animal is now in a more advanced stage, he can scarcely be induced to alter his position, and when he turns, he turns all together. The finger is put into the mouth, and that the jaw is locked; a discovery which might have been made three or four days before, and when the ox might have

been most subject to tetanus, because they may be pricked by a sharp object, or, after a hard day's work, and covered with perspiration, sometimes turned out to graze during a cold and driving wind. It is not an uncommon cause of tetanus in cattle. From long experience, calculate the average mortality among the drovers on their journey from the north to the southern markets; the list of diseases, and with the greatest number of 'locked jaw,' especially if the principal drover is long of age.

In such a disease must be of the promptest character. The animal must be bled until the pulse falters, or rather until the animal is exhausted, and threatens to fall. There is nothing so likely to be of any kind, and to have some effect even in this excessive case, as bleeding almost to fainting. We have known

occasion to show hereafter that the direction which a fluid takes into the stomach into which it goes, is uncertain. It may pass on at once to the third and fourth stomachs and produce its effect on the bowels, or it may accumulate in the paunch without producing any effect. The manner in which it is given may have some influence. If the attendant is in a great hurry to take advantage of the relaxation of the spasm, and pours down the whole drink as quickly as he can, as if it were in one body, it is very likely to find its way into the paunch, and goes quietly to work, and gives a little at a time, or suffers to pass gently down the throat, it will probably flow into the fourth stomach, and the intestinal canal. The explanation of this will be given in its proper place.

The bowels must be opened. After the first dose of Epsom salts, Croton farina, half-pound doses of the salts should be given every three hours until the desired effect is produced; but the first day having given Epsom salts may be changed with advantage for common salt. The common salt should likewise be administered every third hour, and in sufficient quantity, (four or six quarts at least,) and in each of them half a pound of Epsom salts should be dissolved. If four or six doses of medicine have been given, and the animal continues to be constipated, the pulse should be examined, and the horn should be examined as to the degree of fever; if the degree of it is indicated, or if the pulse does not plainly denote that a second bleeding must be resorted to, and carried on as before, if the circulation is evidently affected.

If the animal still remains constipated, it is clear enough that the physic is accumulated in the paunch; and that that stomach is not disposed to act. Strong doses of aromatics and tonics must not be given to the physic, in order to rouse the paunch, if possible, to the evacuation of its contents, and should that fail, recourse must be had to the use of the stomach-pump. The œsophagus-tube must be introduced into the gullet, and carried down into the rumen, and warm water must be poured in until that stomach is filled and overflows; and then the water may either be returned by vomiting, or pass through the third intestinal stomach, and so into the intestines, and the wished-for purgation will follow. This instrument is invaluable to the proprietor of a farm, on the smallest farm, would soon repay the expense of the purchase.

Purging being established, an attempt must be made to allay the irritability of the nervous system by means of sedatives; and that which can be administered, we should perhaps be warranted in saying is the only effectual one, is opium. The crude opium dissolved in

new system,—a part not under the influence of the distemper causes a great deal of inflammation and swelling. Joints may also be covered with sheepskins, frequently to excite constant perspiration, and, if possible, produce heat principally attacked: but the chief dependence is on the copious bleeding at first; a recurrence to it if the distemper is more violent, or fever appears; and the joint influence of bleeding and purging medicine.

If the distemper terminates successfully, the beast will be left sadly out of condition and will not thrive very rapidly. He must, however, be kept as quiet as prudence will allow, and then sold; for he is not fit for much work afterwards, or carry any great quantity of

CHOREA.

Chorea is so frequent in the dog, either after distemper, or convulsions, an affection resembling which we sometimes recognize in the horse by the name of *stringhalt*, we know nothing in cattle.

EPILEPSY.

Epilepsy is of rare occurrence, but one not easy to treat when it attacks animals of all ages, but chiefly those under three years of age. There are few symptoms to indicate the approach of the fit, but a little dulness or heaviness which precedes many other symptoms. The fit might be merely accidental, or the result of very trifling causes. At once the beast begins to stagger—he falls; sometimes he makes the most frightful bellowings; at other times he makes no sound. The head is convulsed; the heaving at the flanks is particularly forcible with which the abdominal muscles act would be impossible to see unless seen; the jaws are either firmly clenched, or the teeth are ground together, and a frothy fluid is plentifully discharged from the mouth mixed with portions of the food, which seem to have been regurgitated. The fæces and the urine flow involuntarily.

The symptoms do not continue more than a few seconds; the fit lasts several minutes, and then the convulsions begin—they gradually cease, and the beast gets up, looks to be unconscious of what has happened,—at length he begins to graze as before.

Epilepsy is usually to be traced to some mismanagement with respect to the diet. It oftenest attacks young cattle in high condition, and has been known to turn out on better pasture than usual, or who have been excited by temporary excitement from over-driving, or the heat

which is the slow effect of rheumatism, or swelling of the joints, or difficulty to move the hinder limbs chiefly which is to be traced to other causes, or perhaps cannot be traced to any particular cause; that, in the great majority of instances, it is, after all, more connected with a rheumatic affection.

There are many low, woody, marshy situations, the cattle notoriously subject to palsy. It is frequent everywhere during a ungenial spring; and there are seasons in which it assumes the character of an epizootic. Old beasts, and those that have been particularly subject to it; and especially when they are cruelly starved, or gather their scanty food during a cold night, after a hard day's labour, is lamentable to think how many of the diseases of our quadrupeds derive their origin from our negligence or cruelty. A damp atmosphere, some cowhouse, from which the litter is rarely removed, but permitted to mingle with the aqueous vapour that is continually rising, is a source of palsy, and especially if to this is added the baneful effects of scanty and bad food and stagnant water. Old cows, whose milk is dried, and who cannot be made to carry much flesh, are very liable to this complaint.

Palsy is usually slow in its progress. There appears to be a general debility; perhaps referable to the part about to be attacked, or to any other; and it will be afterwards recollected, that there is a shaking, or way, or trembling of that part, and sometimes, but not always, a loss of it. The hind limbs are the parts which are most frequently affected. It is at first feebleness which increases to stiffness, awkwardness, and at length to total loss of it. We have seen a few instances in which the fore limbs have been the principal seat of the disease, but the hind limbs have always participated in the affection. In no case, however, have we seen any affection of one side of the animal and not the other; this is a difference in the symptoms of palsy in the human and the brute, for which we are not able satisfactorily to account.

In many parts of the kingdom this complaint is traced to a peculiar cause. The original evil is said to be in the tail; and of this kind, involving the partial or total loss of motion of the tail of the animal, are classed under the name of *tail-ill*, or *tail-rattle*. My friend, Mr. Dick, of Edinburgh, has taken up this subject in an interesting point of view, in the 14th Number of the *Quarterly Review of Agriculture*; and the public are much indebted to him for exposing this false and injurious and cruel superstition. The farmer and the peasant believe that the mischief passes along the cow's tail to the body.

having them convinced that the devil has got into the

a kind consideration, for which he deserves much to reason the case with these foolish people, and what to the purpose, that we cannot refrain from introducing use, in ordinary cases, is said to consist in a softening the extremity of the tail, and is to be distinguished tail being easily doubled back upon itself, and having soft and rather a crepitating kind of feel. But what the case? The tail is lengthened out to the extent of and is formed like a common whip. Towards the extremity gradually, becoming insensibly smaller as regards. At this part is said to be found a soft space—and this again, a firm swelling cartilaginous portion with hair to brush off the flies within its reach. Now long column of bones; the termination with a soft s; this thickened, hard, cartilaginous part at the very extremity covered with hair, but with a view to form and with the greatest possible effect, the insects which the animal?

a of bones forms the shaft or handle of the whip—the flexion between the handle and the thong, while the may be easily recognised to represent the thong, and lash, or point; so that we have a whip to drive away complete one, that the coachman may borrow a lesson

re, that our readers will never be found again looking for an explanation of palsy, or any other complaint; *tail-slip* is supposed to be connected with various t we will allow them to examine it once more, in order ation to the purpose for which it is required, and the of this supposed diseased part, for the more effectual his natural purpose.

, be asked,—is not relief sometimes given by these ail?—Very probably. We do not know what would and use her limbs, if the punishment of the knife, and e tar and salt failed; and we can very readily conceive d would often be beneficial, but not more because an from any other part.

it cause of palsy is the turning out of beasts of every ly of cows, too early to grass, after they have been

be mixed. We would give an ounce of powdered ginger, and crown the whole with a half pint at least of good sound ale. In diseases of a decidedly inflammatory nature, or of such a state of irritability, as tetanus, the physic of cattle should be mixed with emetics, and frequently with ale too. It is to the administration of cordials in cases of fever that we so peremptorily object; on every occasion that fuel should be then added to fire; but in general there is something in the constitution of the cow with which mild medicine does not disagree.

The patient does not quite refuse to eat in palsy, but there is an indifference to food. This is another reason for giving a little ale with the physic. The beast should be coaxed to eat—the food in season should be offered to it, and frequently changed. Small doses of antimonial powder have been recommended as a stimulant, but we have not much faith in the action of this drug on cattle. Hand-rubbing, and plenty of it, should be used two or three times a day about the loins, a stimulating liniment may also be administered, consisting of equal parts of spirit of turpentine, camphorated oil of hartshorn. The chief dependence is on keeping the bowels open, and the animal comfortable; and then in a variable period, from ten days to a month, he will usually get up again.

There is an account in one of the French journals of the cure of a paralytic ox, by the administration of nux vomica. We are not aware that it has been tried by any English veterinarian. The strychnine is worth a trial where the purgative comfortable system fails; but it succeeds so often, that we should be loth to have recourse to another in the first instance. The nux vomica effected a cure, but the doses were enormous, consisting of more than an ounce each.

NEUROTOMY.

Veterinary surgeons have lately adopted an admirable method of relieving the pain which the horse must otherwise endure from the diseases of the foot. They cut out a portion of the nerve of the foot, so that it cannot interfere with the motion of the limb, because there are no nerves beneath the knee for the nerve to supply; but they cut off the communication of the feeling of pain. If a nerve concerned with feeling be cut, the impressions, whether of pleasure or of pain, made on it, by the vision, cannot be conveyed to the brain and therefore the animal

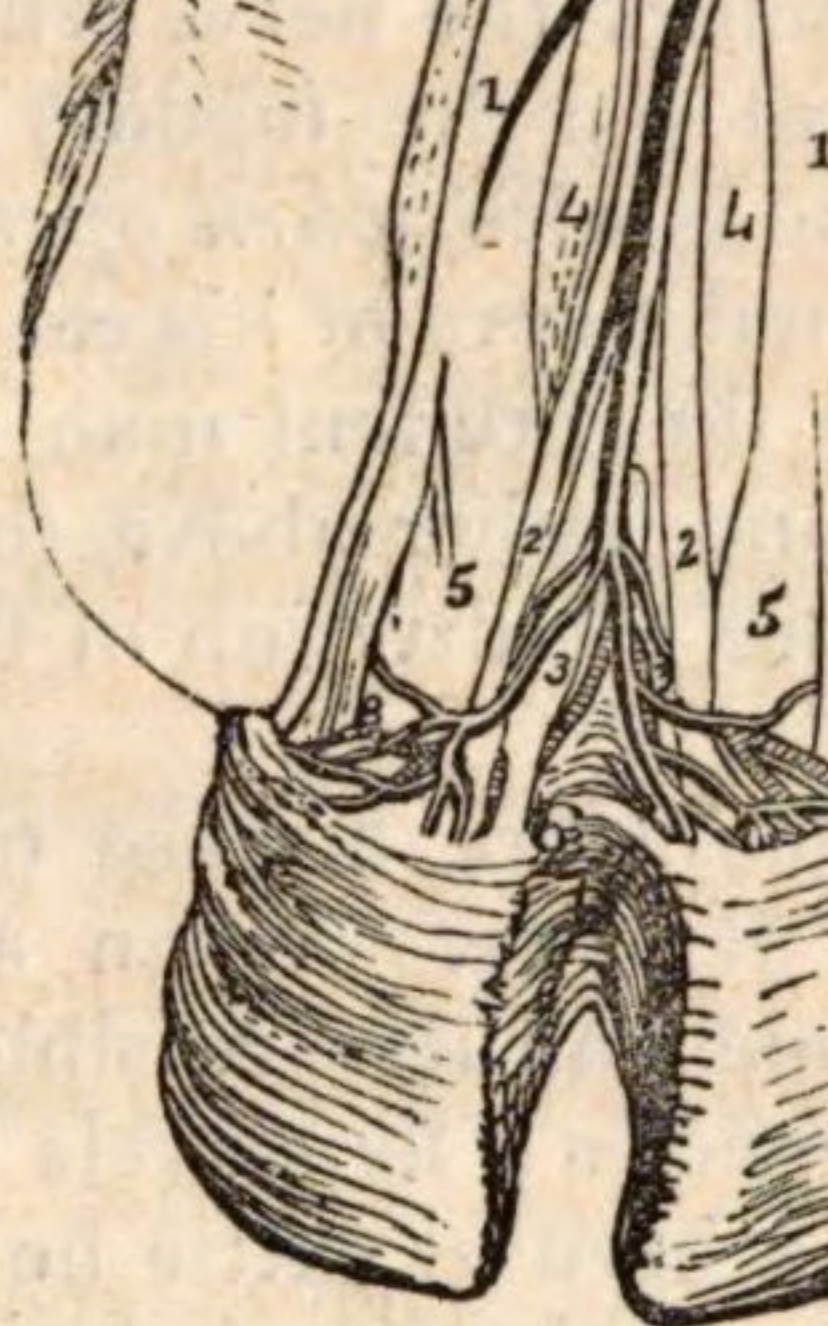
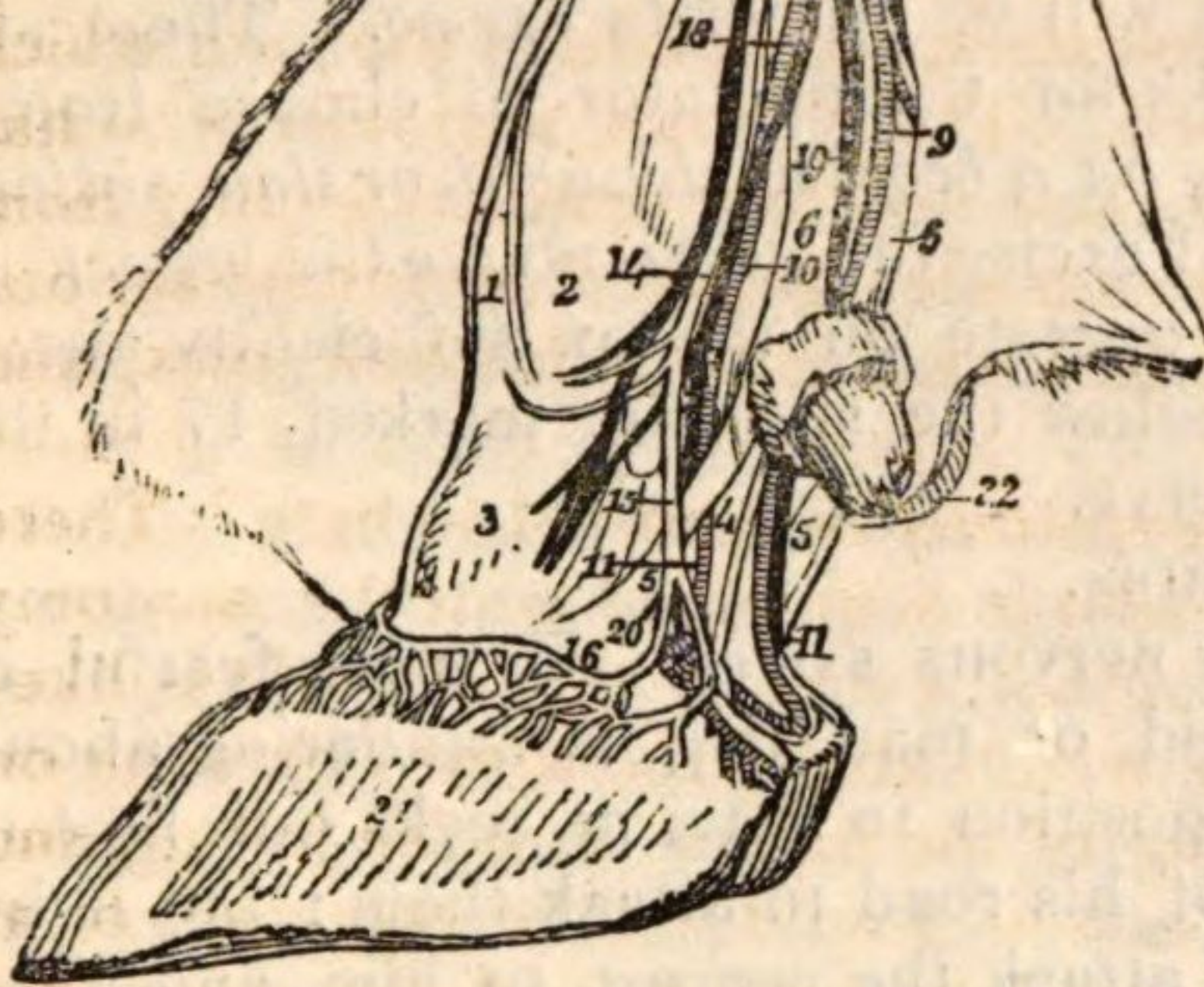
There is not a farmer who has not had cows in his dairy a time, full half of their milk, on account of the pain which their feet have occasioned. There is not a grazier who has lost the advantage of three and four months' feeding from it. In the London dairies tender feet is often a most serious evil, which compels the milkman to part with some of his best cows, and in a bad condition too.

Should the operation of neurotomy be resorted to here? There is not in it to any one who is acquainted with the anatomy and its beneficial effect cannot admit of dispute. It is like many of the objections which attend the same operation on other animals, the alteration in the going of the animal, and the jolting and the great uncertainty of action would not be regarded, or at least not so much as here.

The ox seldom would be subject, and the cow never to the kind of hard and rapid work which, the sense of pain being removed, would batter and bruise the parts, increase the inflammation, and do much evil.

As thus performed:—The ox is cast and secured, the hair is closely cut from the limb or limbs to be operated upon. The limb is to be removed from the hobbles, and distended, and a band is passed round it beneath the knee, to prevent bleeding. The cut is made on the back of the leg, (the cut, p. 308, No. 1, represents it) but a little inclining towards the inside, and about 2½ inches from the fetlock, the artery will be felt for, and recognized by its pulsation immediately inside of the artery, towards the other leg, so close to that the nerve; so that the nerve will be found at the distance of an inch within the artery. The artery, we repeat, is distinguished by its pulsation—the vein by its yielding to the pressure of the finger—the nerve by its being a hard, unyielding body. The operation is made by a cautious incision, an inch and a half in length upon the skin, care merely to cut through the integument. The cellular substance is then dissected through, and the nerve exposed. A crooked needle, with silk, is next passed under it, to raise it a little; it is then cut out; the first incision being made at the upper part, in order that the second cut will not be felt. There is only one nerve to be cut, as the operation is to be performed a little above the point where the nerve enters the hoof.

The wound are now brought together; a small bit of tow



[*Leg and Foot of the Ox.*]

No. 1.

1. The tendon of the extensor of the foot.
2. Capsular ligaments of the fetlock joint.
3. Capsular ligaments of the pastern joint.
4. Tendon of the perforans muscle.
5. Ligamentous portions.
6. Tendons of the perforans and perforatus muscles. [phalangeus.
7. Division of the tendon of the carpo-
8. The lateral external artery of the canon, or shank.
9. The mesian and posterior artery of the fetlock.
10. The lateral internal artery. • [arteries.
11. The posterior branches of the plantar
12. The lateral external vein of the canon.
13. The lateral internal vein of the canon.
14. The lateral vein of the pastern.
15. A branch which is formed by the plantar veins, and the venous reservoir of the plantar.
16. The vascular reservoir, covered in part by the coronet.
17. The plantar nerve before its bifurcation.
18. Nervous branches, which, after having parted from the preceding, take a direction, the one backward and downward to the lateral and external part of the fetlock, and the other downward to the internal part of the same joint.

19. The mesian division of the
It pursues its course
of the same name.
20. A continuation of the
accompanying the
artery.
21. The sensible laminæ of the
corresponding with the
minæ of the hoof.
22. The usual horny excre-
posterior part of the foot.

No. 2.

1. The tendons of the exten-
tern below their bifurc
2. The tendons of the exten
3. Internal lateral ligaments
4. The capsular ligaments
joint.
5. The capsular ligaments of
joints.
6. A portion of integument,
the two hoofs at their
internal part. The
brought principally i
the superficial veins of
the anastomosis of the
superficial veins bel
the figures 2, 2; and
plantar arteries and ve
down.

the nerve which it will be proper to excise. There are the median trunks for the operator to choose from ; *se, when operating on a beast of draught or slow action,* care of his case, and excise the nerve above the fetlock in a prudent man will operate on the ox sufficiently above rather above than below the situation marked 17 in the division of the nerve.

RABIES.

more disease of the nervous system, the most fearful of diseases. When a rabid or mad dog is wandering about, with an irrepressible disposition to bite, he seeks out first of all ; he travels out of his road to attack them : but if his object is cattle he will attack the nearest to him, and if he meets resistance he will set upon the whole herd and bite as many as he can.

There have been celebrated as preventing the appearance of the disease, confidence can be placed on one of them. Let the farmer, and perhaps the life of the beast, by giving credit to these old women in many a village who prepare wonderful drinks, but the stories of their success are mere 'old wives' tales and nothing else.

On any suspicion that a beast has been bitten, the wound should be searched for. If any one was by when the attack was made, he will be able to point out the limb that was most in danger as actually seized.

When a wound is discovered, the hair must be cut from the edges of it, and a stick of nitric (nitrate of silver), the stick being reduced to a point, must be brought in contact with, and made thoroughly to penetrate every part of it. If there is any doubt about the probability of the caustic being brought into contact with every part of the wound, it must be made with a knife, so as to give free access to the substance applied. The caustic being preventive, and the caustic being freely used upon the wound, and there being no other wound, the beast is safe. No animal thickly covered with hair, will venture to say that a wound is not dangerous? It also unfortunately happens that the slightest scratch is as dangerous as a lacerated wound.

On any uncertainty, therefore, the farmer must look out for the disease, if it is to appear at all, it will be about the expiration of a year, though there will be no absolute security in less than a year or of months.

The animal will appear dull, languid, feverish, scarcely grazing, and

under what sportsmen call dumb madness, is frequently harmful at every stage of the complaint; so in the ox, the symptoms thus mentioned are succeeded by frequent and pitiful lowings—and a painful attempt to evacuate the fæces. Staggering and the loins appear on the second or third day, and this is soon succeeded by palsy of the hinder extremities. The animal sits on its haunches, making ineffectual attempts to rise—looking wofully around it, and eagerly plunging its muzzle into the water, when placed within its reach, but without attempting to do mischief. At other times, the early symptoms are followed by a dreadful state of excitation. The animal is eager to do mischief; he stands across the path bellowing incessantly, and striking the ground with his horns. In a few cases, the quiet and melancholy character suddenly changes into that of a ferocious character. There is no cure now; no nostrums will have avail here: and the animal should be destroyed as soon as possible. One circumstance also should be fully remembered. The poison in all rabid animals seems to be in the saliva; and the saliva of an ox is as dangerous as that of a dog. I inoculated a dog with the saliva of a rabid bull, and it became rabid and died. Dr. Ashburner inoculated a fowl from the saliva of a rabid cow, and two months afterwards the fowl had a wild appearance, and its eyes were blood-shot; it ran at the other fowls, and became gradually paralytic and died.

The rabid ox may attempt to do more mischief with its horns and teeth, but occasionally it will bite; or, if it should not, yet it will meddle with too much. This dangerous foam is continually coming from the mouth; it may fall on a sore place, and it is then as dangerous as if it had entered the circulation by means of a bite.

The knowledge that the virus is confined to the saliva will prevent any other matter that has occasionally been the cause of consideration. A cow has been observed to be somewhat ailing for a long time, but she has been milked as usual; her milk has been mingled with the rest, and has been used for domestic purposes as heretofore. She was at length discovered to be rabid. Is the family safe? Can the milk of a rabid cow be drunk with impunity? Yes, perfectly so, for the virus is confined to the saliva. The livers of hundreds of rabid dogs have been eaten in days of ignorance, dressed in all manners of ways, fried as nicely as possible, as a preventive against madness. Some merchants have sent the flesh of rabid cattle to the market, and it has been eaten without harm; and so, although not very pleasant to the taste, the milk of the rabid cow may be drunk without the slightest

THE NASAL BONES.

development of the frontal bones, in order to form a
the horn, all the bones of the face are proportionately
pushed out of their situation; and therefore the *nasal*
(p. 273, and *q*, p. 274) are little more than a third so
the horse, (*p q*, p. 66, and *a*, p. 68 'Horse'). They are
ribed in the horse, with each other, and with the fron-
(p. 274), with the lacrymals (*c*, p. 273), with the superior
(273 and *x*, p. 274), and with the anterior maxillaries (*z*,
pushed down quite out of their place, and not being so
n of danger, for a blow aimed at the head of the ox
higher, there is not the intricate and mortised con-
of the other bones except the frontals, which is found in
are broad in proportion to their length; and as, on
struction of the mouth of the ox, the muzzle of that
ed to be broader than the muzzle of the horse, each
two points, with a hollow between them; and as the
e two lie in contact with each other, the nasal bones
as actually ending in three points instead of one, and
erably-extended surface. It is thus wide for the greater
sclerotic and cartilage; for the muzzle must be broad and
n order to compress and hold the grass firmly, until it
partly torn by the pressure of the incisors of the lower
it will be presently described, and which occupies the
in the upper one.

e is more closely examined, it will be found that it does
under surface, of one continuous arch as in the horse;
an additional channel hollowed out of it, and running
f the arch. It can be seen above (*r*, p. 274.) This is
e upper meatus or passage of the nose (seen in cut
ve the upper turbinated bone, and which has nothing to
breathing, but terminates in a blind pouch, so that the
e, loiter there, and any odoriferous particles which it car-
ger impression on the membrane of the nose. Only a
could be spared to the horse, because the nostrils were
es he had; but a larger one can be given to the ox,
air enters and is expired through the mouth. Therefore,
ons that will be stated presently, the ox has an acuter
n the horse.

The nasal cavity contains the *septum*, a cartilaginous division from the suture in the roof between the nasals, to a long bone of a groove, and named the vomer, and placed on the floor of the top of the nasals to the æthmoid bone, dividing the cavity into two equal parts. In the horse, the division was perfect, there was no communication between the two nostrils, and this was due to the ravages of that most dreadful of all the disorders to which the subject,—glanders; but the ox, being in a manner exempt from or at least from any disease bearing the dreadfully contagious character of glanders in the horse, there is no necessity for a division, and therefore the vomer, when it has reached about the middle of the cavity, begins to leave the floor; and it separates from the floor and more, as it approaches the posterior part of the nostrils, to give free and extensive communication between them. This is a still more effectual provision to be made for the perfection of the sense of smell, and which we will now describe.

THE SENSE OF SMELLING.

The *olfactory*, or first pair of nerves, connected with the sense of smelling, is abundantly larger in the quadruped than in the human. In the one it is merely connected with occasional pleasure or annoyance; in the other it is connected with life itself. The sense of smell differs in size in different quadrupeds, according to the necessity. The ox has for an acute sense of smell. The brain of the ox is about half the size of that of the horse, and he does not possess the sense of smell of the horse; but, as we have before observed, not being so complicated—being oftener sent into the fields to shift for himself by day, being usually turned out at night, he has occasion for it, and his olfactory nerve is nearly as large as that of the horse; (the right way of judging,) comparing the bulk of the two, the ox's is a great deal larger.

This nerve comes in contact with a thin plate of bone, the *cribra* plate, (perforated like a cullender,) of the æthmoid bone, which divides the nasal cavity from that of the skull; the same is the case with a portion of another bone interposed between these plates. See p. 274. The pulpy matter of the nerve is pressed through the bone, and spread over a portion of the membrane of the nose.

ated like the cribriform plate of the æthmoid bone,—
derian membrane, with the nervous pulp spread over
at membrane,—and a thousand communications be-
s in every part, by means of the gauze-like, perforated
es.

s either covered with an unctuous fluid, or the air
uplicated that the pure atmospheric air alone is suffered
st odoriferous particle or solid substance of any kind
firmed snuff-taker will afford a sufficient illustration of
mous may be his pinch, and with whatever force he
t an atom finds its way to the lungs, or even into
hole is arrested by some portion or other of the
ane. This is not only a wise provision for the per-
of smelling—it not only secures the contact of every
nbrane of the nose, and its temporary lodgment there,
r passages from many a source of annoyance, danger,
ring the numerous deleterious substances which, under
are floating in the air, it is scarcely possible to con-
l could live an hour without some such protection to
ords.

provided an acute sense of smell for the ox: it was
cessary that the animal should detect the peculiar
t, as connected either with nutrition or destruction.
ches him much, but he is more indebted to the lessons
he spring of the year, when the scent of the infant
eloped, cattle are often deceived with regard to the
e; they are subject to peculiar complaints of indiges-
ometimes poisoned.

Linnæus visited Tornea, the inhabitants complained
ad killed many of their cattle, and especially when first
meadows in the spring. He soon traced the disorder
ck, which grew abundantly there, and which in the
not know how to avoid. The power of instinct is
t have not been reclaimed from a state of nature; but
ey become domesticated, instinct ceases to prompt,
ent on our guidance, or on the lessons which expe-
is when our calves and lambs are taken too soon
urned with little or no experience into the pasture,
ately of every herb that presents itself, and many of

The bleeding has gradually ceased, except in one case, which again and again, and would have destroyed the beast had it not been somewhat anticipated.

LEECHES IN THE NASAL CAVITY.

We had often heard of leeches having fastened on the mucous membrane crept into the nostril of the ox when drinking at a stagnation of water, which the ox is strangely fond of doing. One of these blood-suckers, once introduced himself into the cavity, will usually shift his place, biting here and there, and causing a very considerable hemorrhage. The beast will tell us plainly enough the cause of the bleeding by his uneasiness which he will express, and by his continually tossing his head about.

On examining the nostril in a good light, the leech may be seen. It was so in a case that we recollect; and covering the finger with a little salt, we were enabled to introduce it high to detach the blood-sucker from his hold. At other times, if a leech is suspected, salt and water may be injected up the nostril. In some events, however, when he is fully bloated, the intruder will not come out of himself; and, except he has crept up the superior meatus, there is no air passage, he will be expelled by the sneezing. Only temporary inconvenience can result from this accident, as the bleeding will in due time stop, even from so vascular a membrane as the lining of the nose.

POLYPUS IN THE NOSE.

This is a rare disease in the horse, and still rarer in the ox. We have seen only one case of it; and that might have been said to be a polypus in the pharynx than in the nasal cavity, had not its base been traced into that cavity, and seemingly attached to the upper part of the inferior turbinated bone. A cow was anxious to eat, and was in good health; but occasionally she was unable to swallow, and a pellet was returned with an effort resembling vomiting. This continued until she was scarcely able to eat, and was rapidly losing flesh. It indicated some disease of the back part of the mouth, or the lower part of the gullet; and we caused one of the pieces of the trachea, in which the tube of the stomach-pump is passed into the chest, to be made with an aperture sufficiently large for the hand to go in. The cow was secured and the mouth-piece fixed, and the hand passed into the fauces, when a round body, moveable and attached by a cord

the natural consequence or progress of it; but simple does occasionally exist in the ox. We are too often led by a discharge from the nostrils, mucous, purulent, and *unaccompanied by cough*. It is seen in heated cow-houses; it arises from imprudent exposure and it is frequently produced by the dust and gravel of a road. The ox was not designed to be exposed like the horse to this dust, and he has no false nostril to turn off the current of particles from the more susceptible parts of the nasal cavity. Oxen driven any considerable distance to fair or market rather, usually suffer from coryza. Dairymen whose cattle are driven half a mile or more on a dusty road, wonder that their cattle should have such frequent discharge from the nostrils, and should sometimes run on to hoarse. The cause is long little suspected by them.

Cal coryza in cattle. During the winter season, and from mismanagement—from undue exposure of the animals to extremes of heat and cold, there is considerable nasal discharge, which does much with health, but unpleasant to the eye and nose, and which, in despite of the most careful treatment, does not disappear. When, however, the genial warmth of spring returns, the discharge suddenly disappears. This, however, is one of the most dangerous signs, for it will occur that, from some improper management, the cough gradually become connected with the nasal discharge. The practitioner who has observed this connexion, nor is he alarmed although the discharge ceases: nay, he cares not for it, although the cough should be a frequent and harassing one, but the animal still carry its usual flesh, and yield its full quantity of milk. However, the milk fails, and the cow begins to lose condition, and the farmer looks about him, and then it is too late. We point again and again; for it is the source of the mischief attendant on chest affections in cattle.

Never, speaking of coryza, inflammation of, and dissection of the membrane of the nose. It is a matter of the utmost importance to the practitioner of, or the attendant upon cattle, to assure himself of the nature of the coryza. He should carefully examine whether there is any wheezing, whether that cough is painful—any increased laboured respiration, any diminution of appetite—suspension of rumination, any fever, felt at the left side, and the temperature of the nostrils. The best ascertain this last particular. In the absence of these, still we have inflammation, and of a cha-

from it. A very slight degree of hoose, however, and a painful hoose, should be received as a sufficient indication that powders alone are to be used.

If the coryza degenerates into catarrh, bronchitis, or into the lungs, the proper treatment will be indicated when those taken into consideration.

GLANDERS.

Of this dreadful disease of the membrane of the nose I have never met with a case in cattle. Some singular accounts are on record, but they are of doubtful authority. We acknowledge it is not a point fairly settled, and it deserves peculiar attention from the proprietors of cattle.

FARCY.

There are cases, however, the authenticity of which cannot be doubted, which bear a closer resemblance to *farcy*. One of the most decisive characters of farcy in the horse, is inflammation, and the use of the absorbents, and particularly at the situation of the v. have a *corded* feeling through a certain portion of their course. Tumours, *buds* or *buttons*, appear at a greater or less distance from each other along the cord.

There were four oxen in a farmer's yard, each of which had a violent cough, and a large corded absorbent could be traced from the fetlock up to the forearm. Farcy-buttons were evident to the touch, but to the eye, through the whole extent of the cord. Most of them were hard, schirrous; and others had suppurated. The hot iron was applied to the *buds*, the wound healed, and the cordiness of the absorbents gradually diminished, and the disease disappeared.

Two months afterwards, however, the farcy-buttons and absorbents were seen again, and *the cough returned at the same time*. The same means were adopted with the same results. All were cured. Two of them were sold, and on the other two the disease did not return, nor was it communicated to any of the cattle that grazed on the same pasture. It should be observed that these cases did not occur at the same time, but a space of three years occurred between the first and the last.

Was this farcy?—need the farmer entertain serious apprehensions of this fatal disease breaking out in his herd? The practitioner

...tion, and we are happy in being able to record it, empty from glanders and farcy.

THE BONES OF THE MOUTH

The greater part of the roof of the mouth are formed by the *maxillary*, or upper jaw, seen at *a*, p. 273, and *x*, p. 274. The bone of the face, is materially diminished in size by the presence of the frontal bones. It articulates with the lacrymal bone at *b*, p. 273, and the malar bone at *d*. The ridge which runs along the upper jaw bone, in the horse, for the attachment of the masseter muscle, which may be seen below *k*, (p. 66, Horse,) is wanting; the bone is roughened and tuberculated, to answer the purpose. In the dog, p. 273, is a little black mark, representing the roughness which the nerves and blood-vessels proceed, to the front of the face.

The *maxillary* consists of two plates, irregularly separated from each other, the one forms the external, and the other the internal wall of the nasal cavity, seen at *x*, p. 274; and then extending upwards, and as the *nasal bone*, the commencement of which is seen at *x*, it completes the bony roof of the mouth. The inferior cells contain the back teeth, or grinders; the superior ones contain the sinuses; and in the ox there is a new set of cells, the *ethmoidal*, between the plates of the bone, between the roof of the mouth and the roof of the nasal cavity.

The *maxillary* bone, p. 274, occupies considerably more of the roof of the mouth in the horse.

The *maxillary* bone is, compared with that of the horse, a great deal smaller; there is neither the firm and complicated connexion of the *maxillary*, nor are there any tusks, or incisor teeth. There are considerable apertures, one of which is seen between *x* and *y*, which leave a somewhat extensive part of the roof of the mouth, the nose occupied only by cellular substance and membrane, to give the strength required in the part, and therefore there is no bony support.

The floor of the mouth is the *inferior maxillary*, or lower jaw. It also partakes of the shortness of the bones of the face, but is somewhat altered in form. It contains the only incisor teeth, eight in number, and six molar teeth on each side. It is of the same size which is found in the lower jaw of the horse, (*a*, p. 273,) and goes back in a manner straight to the angle, where it articulates with the *temporal bone*.

pally characterized. The muscle, being inserted so near to the with great mechanical disadvantage; but, although smaller than the horse, it is sufficiently powerful for every purpose that is required.

THE CHEEKS.

The outer walls of the mouth are the cheeks and lips. They consist principally of muscle, (the masseter and the buccinator) They are covered externally by the common integument, or lined by the membrane of the mouth. There is likewise considerable glandular substance in their composition, and these glands have ducts opening into the mouth, and assist in supplying it with moisture.

THE LIPS.

The lips form the anterior opening of the mouth; they consist in gathering and retaining the food. They likewise consist of a peculiar, glandular, and cellular texture; and of much, and in the especially, of condensed substance almost resembling cartilage. The muscles give them the power of motion, and particularly that of seizing and compressing the food. This is especially necessary because there are no upper front teeth, and for this purpose also cartilaginous matter was added to them, and most of all to the lower lip. Simple muscular substance would be too yielding to retain the food when it was to be forcibly separated from the stalk or root. Of this peculiar function of the upper lip of the ox, it is wider and thicker than that of the horse, in order that it may be brought better in contact with the herbage, and gathered in sufficient quantities.

Being so much employed for this purpose, there is a want of sensibility about the lips of cattle very different from the acute sensitiveness of the parts in the horse. The ox is seldom used for the saddle. The oxen, described p. 268, are sometimes ridden, but their pace is steady, and they are guided by reins perforating the septum of the nose. The damsels in the Mandara valleys, (p. 5,) when they ride to show off all their finery, and contrive to torture their horned palfreys into all manner of like caperings and curvelings, also effect their purpose by means of a leathern thong passed through the cartilage of the nose*. The

* The Chili coachman, when he starts his six-in-hand team, guides his horses in the same manner, but he has a singular way of getting them along:—A thin stick, five feet long, projected horizontally, is lashed to the roof of the cart, having at one extremity a grooved hole, through which the string passes: a goad is made of a h

er lip must materially assist in the firmness of the
cessity be continually in absolute contact with the
always be in the cleanest state. Nature has given the
gainst this. The outer covering of the upper lip is
glands, and a fluid can be seen pouring out from
nding and ruminating, is watched, drops as clear as
rsing one another down his muzzle, and falling on
oper lip, in health, is always wet; the insect cannot
cannot accumulate; or if the one should adhere, or the
t, the long tongue of the beast is protruded, it passes
surface, and all is clear again.

ble notice of the secretion from these glands when we
ome judgment of the health of the animal, and the
While the muzzle is moist, *i. e.*, while the natural se-
rward, there is no great constitutional disturbance, and
at danger; in proportion as that secretion is lessened,
pathy with some local affection; and when it becomes
d, it is an indication of so much universal derange-
s us to look about us. There is nothing more in this
y other, but it is one which is easily observed, and the
n be accurately marked.

THE MEMBRANE OF THE MOUTH.

elicate, compared with the external integument. Every
lined with it, and it contains numerous glands, occa-
ttle papillæ, from which a considerable portion of the
e mouth is derived. The gums and the bars are co-
ane, but they are denser and less sensible.

end being about four inches in diameter, while the smaller runs
e front end is generally made of a piece of willow, secured to the
rmed at the tip with an iron point, neatly and curiously lashed
e. This goad is hung in a kind of inverted stirrup attached to
entioned string, by pulling of which the driver, as he sits in the
ss at his pleasure the stirrup which serves as the fulcrum of his
rly in equilibrio, as the thick butt-end counterbalances the lighter
rd: thus suspended, the point can easily be thrust forward or side-
haunches of the forward yoke of oxen: about five feet from the
goad, armed with iron, hangs pendent by a string, so that by
y motion, and lifting the butt-end, the point can be dexterously
of the driver, upon the haunches of the second pair of oxen; a
and serves to goad forward the shaft-yoke.—*Muir's Travels in*
i. p. 244.

stronger. The bars thicken towards the fore part of the mouth, they accumulate into a pad, or cushion, which covers the convexity of the anterior maxillary bone. This pad is of a somewhat fibrous and elastic nature than the bars, and stands in the upper incisor or cutting teeth. The grass is collected and rolled by means of the long and moveable tongue; it is firmly held between the lower cutting-teeth, and the pad, the cartilaginous upper lip assists in this; and then by a sudden nodding motion of the head, in which the pterygoid muscles are the chief agents, the little roll of herbage is torn or cut off, or partly both torn and cut.

The intention of this singular method of gathering the food, is somewhat difficult satisfactorily to explain. It is peculiar to ruminants, who have one large stomach, in which the food is kept as a kind of receptacle until it is ready for the action of the other stomachs. While in this place there it is in a state of maceration; it is exposed to the uniting influence of moisture and warmth, and the consequence of this is a species of decomposition sometimes commences, and a vast deal of nutriment is extricated.

That this should not take place in the natural process of retentive maceration, nature possibly established this mechanism for the first time in the eating of the food. It is impossible that half of that which is thus gathered can be fairly cut through; part will be torn, and no little portion will be torn up by the roots. If cattle are observed while they are grazing, it will be seen that many a root mingles with the blades of grass; and the roots have sometimes no inconsiderable quantity of earth about them. The beast, however, seems not to regard this; he eats on, dirt and all, until his paunch is filled.

It was designed that this earth should be gathered and swallowed, and this was the meaning of this mechanism. A portion of absorbent earth is found in every soil, sufficient not only to prevent the evil that would result from occasional decomposition, by neutralizing the acid principle as it is evolved; but perhaps, by its presence, preventing decomposition from taking place. Hence the eagerness with which cattle, who have not the opportunity of plucking up the roots, will devour the earth to evince for mould. It is seldom that a cow will pass a newly-raised hill without nuzzling into it, and devouring a considerable portion. This is particularly the case when there is any degree of indigestion, and the mould here is comminuted to the greatest degree, and probably has a peculiar freshness. When describing the Kyntore ox, at page 100, I remarked that he always had a basket of earth standing by him, and he occasionally ate a considerable quantity, and which operated as

the roots, and the pasture destroyed, and the animal
hoaked with this absorbent earth. The part of the
is covered with enamel both to produce and retain
ess. The crown of the tooth, or that part of it
m, presents a surface somewhat convex externally,
n the gum, while towards the mouth, it has a con-
gradually in thickness as it recedes from the gum,
edge, than which in the young animal few scissors
stic nature of the pad preserves it from laceration ;
bstance interposed, the grass on which the animal
cut through.

e as well adapted for the mingled laceration and
fibres which are submitted to their action. Instead
at uneven and roughened surface of the molars of
proper millstones for the grinding of corn, or dried
here are two oblique surfaces, those on the lower
upwards and from without, inwards, and those in
in an opposite direction, while the upper surface of
deep grooves. There are three in the last molar,
m cones of enamel sunk deep into the substance of
as knives, and cannot be roughly meddled with
d these receive corresponding projecting portions
l. From the prolonged, although leisurely action
it happens that the food is reduced to a state of
in order that every particle of nourishment may be
e horse requires only that portion of nutriment,
ed and for the purpose of present exertion ; and his
f composed of vegetable fibres ; the ox, on whose
extract every particle of matter which the food con-
a fibre is seen in the fæces. The dung of the first
; that of the second, except it be a stall-fed beast,
e worth.

OF CATTLE AS INDICATED BY THE TEETH.

e horns of cattle (p. 279,) we spoke of the usual and
timating their age by the horns. Far surer marks
eeth, and where there can be little deception from
for their interest would generally lead them to give
rance than nature has allowed.

ewly-born calf presents an uncertain appearance,
her having exceeded or fallen short of the average
m. Sometimes there will be no vestige of teeth.



A
are
wh
in t
Th
sha
nea
wil
wil
too
rem
tral

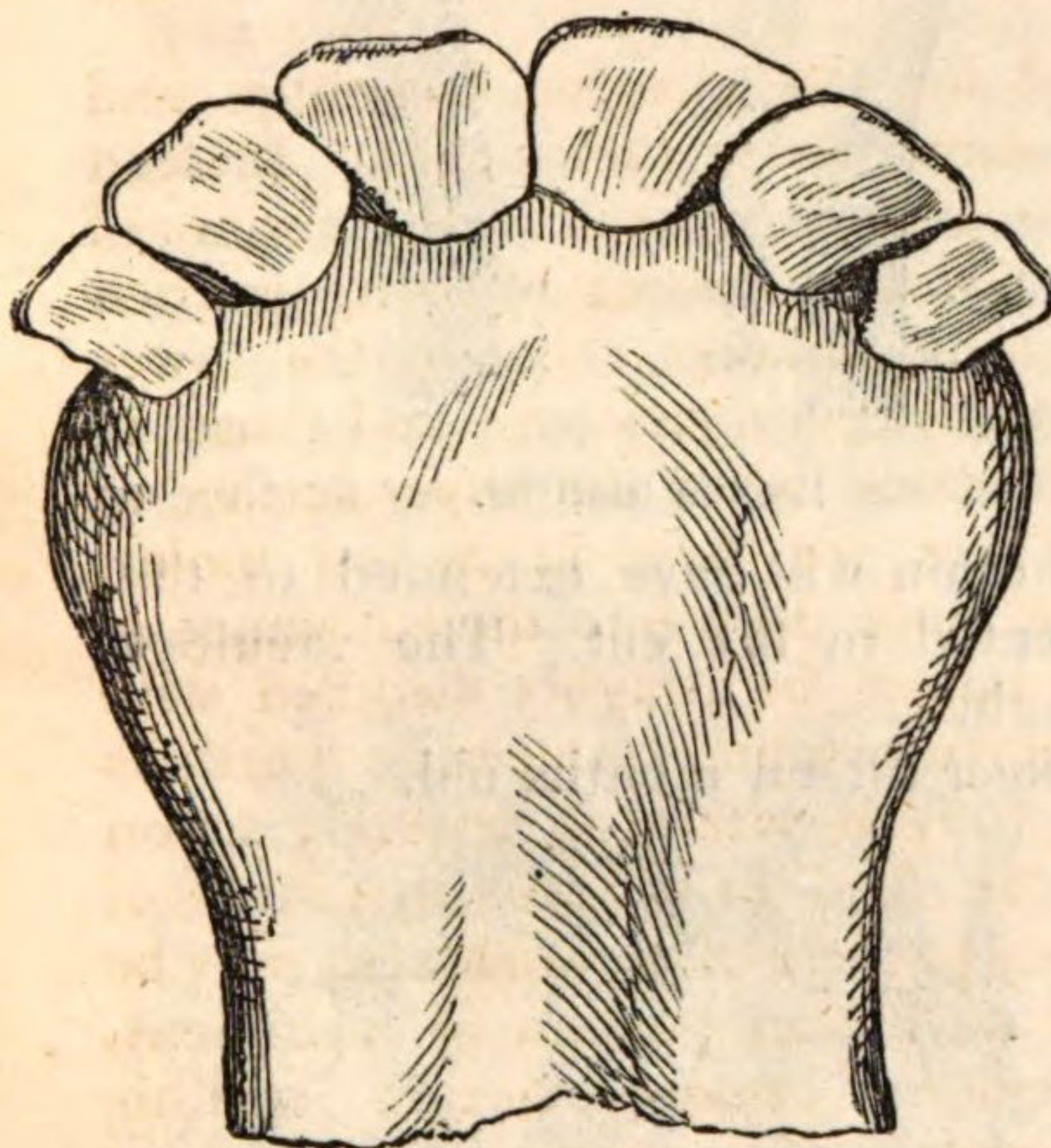


Birth.

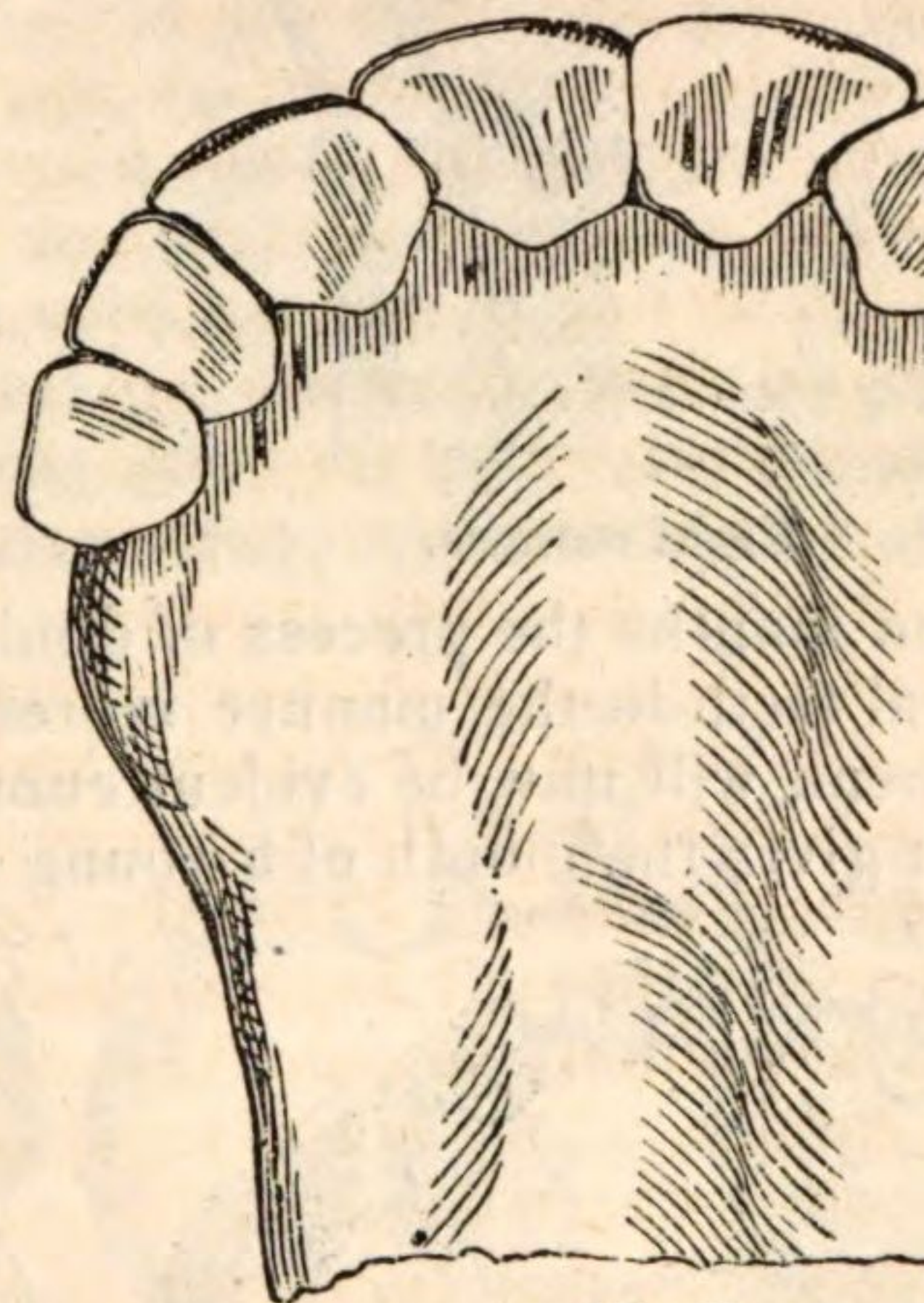


Second week.

At the expiration of the third week, the animal will have six incisor or front teeth.

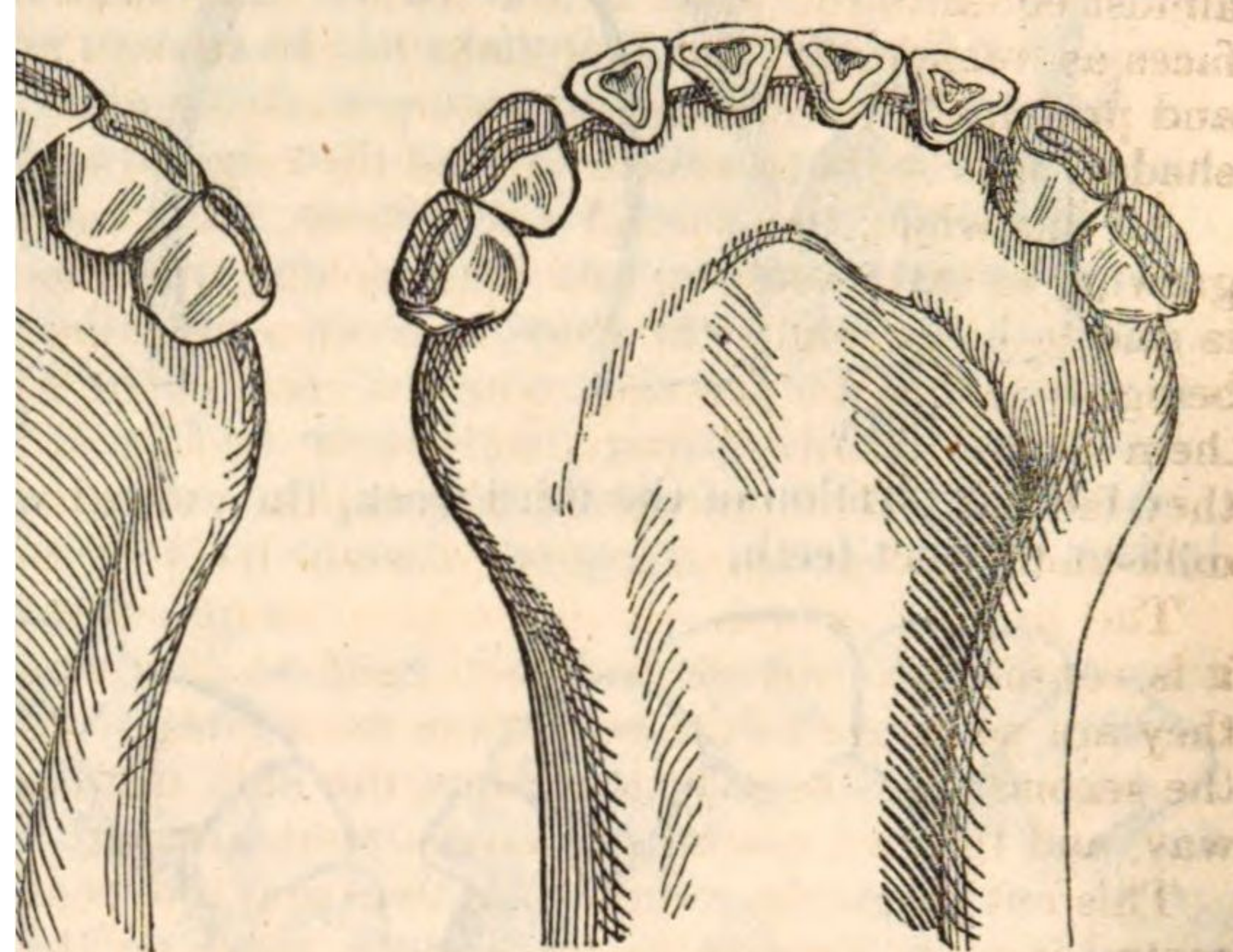


Third week.



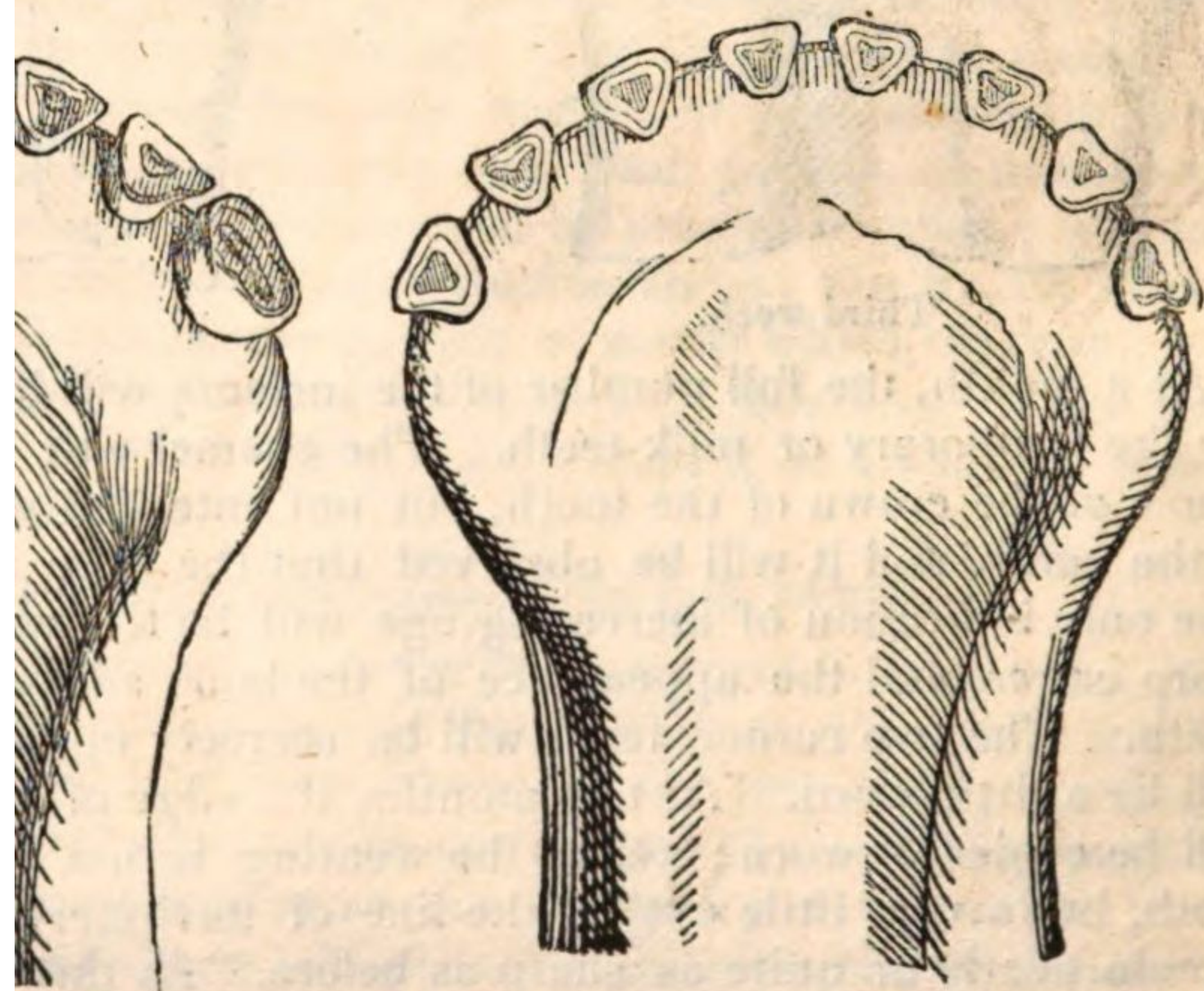
Month.

At a month, the full number of the incisors will have appeared are the temporary or milk teeth. The enamel will be seen cover whole of the crown of the tooth, but not entering into its composition in the horse, and it will be observed that the edge is exceedingly sharp. The only indication of increasing age will be the wearing down sharp edges, and the appearance of the bony substance of the teeth underneath. The two corner teeth will be scarcely up before the central will be a little worn. At two months, the edge of the four central will be evidently worn; yet as the wearing is not across the tooth, but a very little out of the line of its inner surface, the edges remain nearly or quite as sharp as before. At three months the central teeth, and at four months the whole set will be worn, and the



Eleven months.

ths.
 e process of diminution will have extended to the
 e manner represented in the cut. The vacuities
 v be evident enough.
 outh of a young steer fifteen months old.



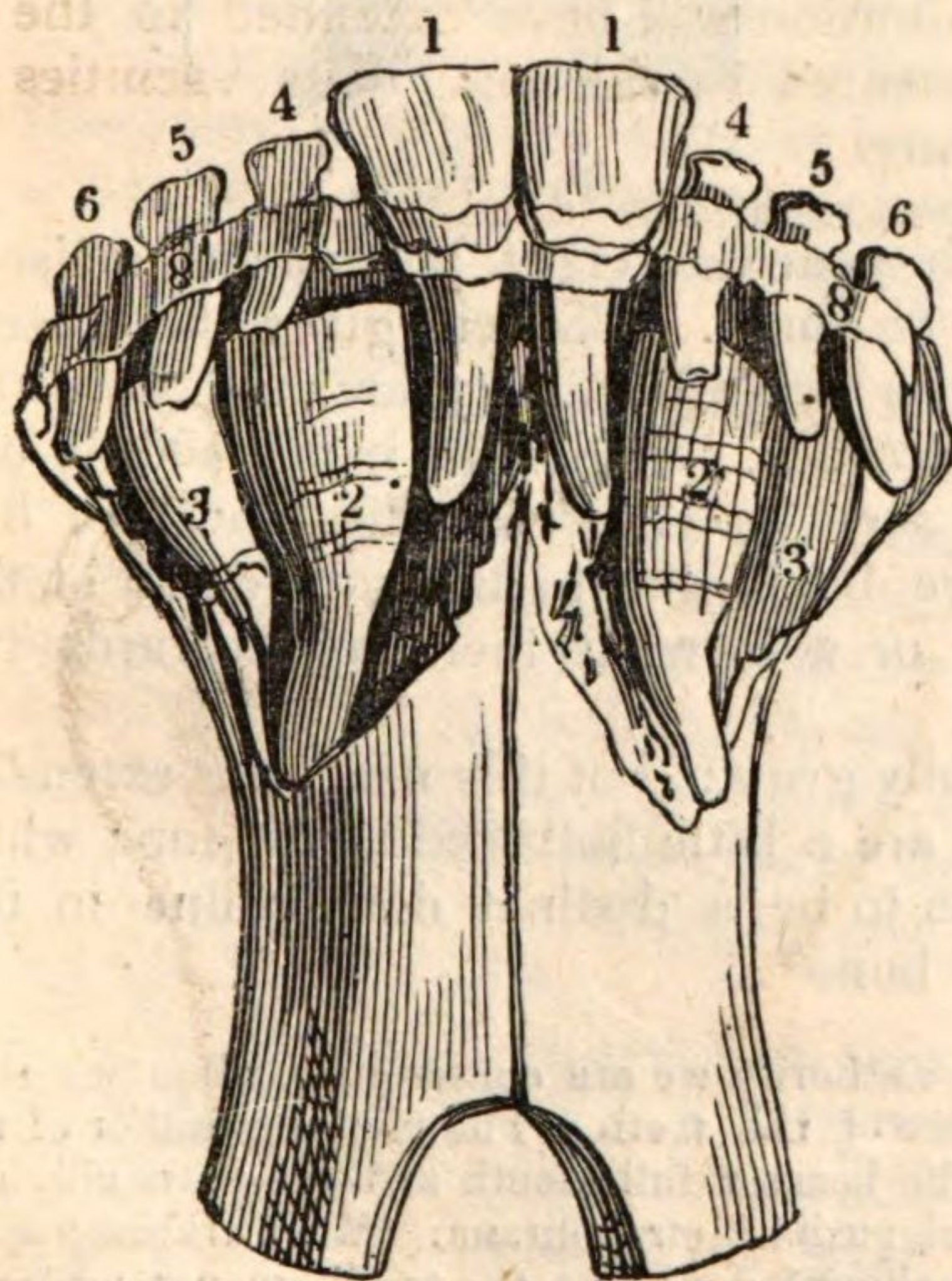
Eighteen months.

and principally in the central teeth; while another, more or less shaded, will begin to appear around the original mark.

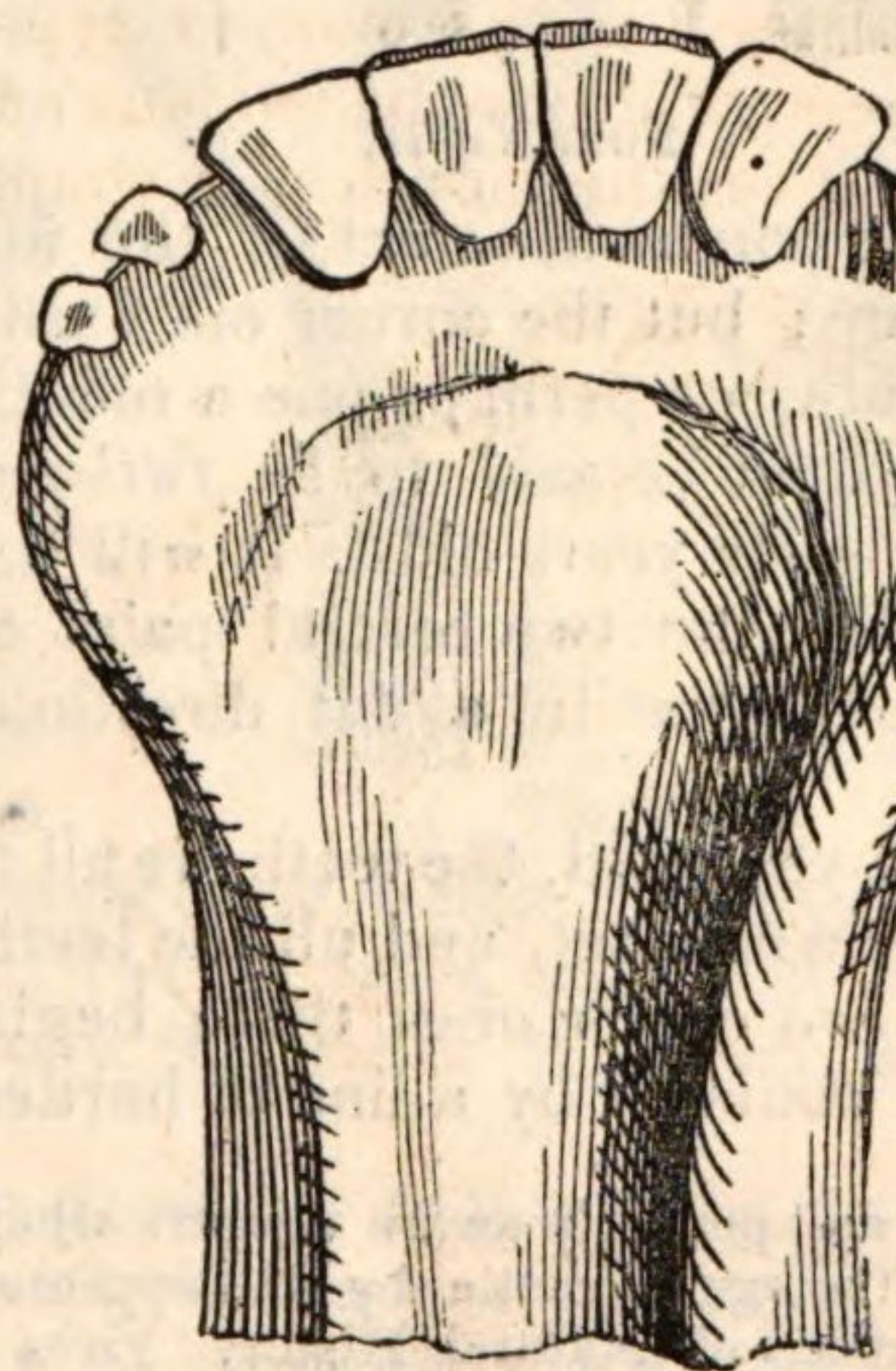
All this while, the second set of teeth, the permanent ones, are growing in their sockets, and approaching towards the gums; but it is said to be generally the case with other animals, and with the horse being in particular, pressing upon the roots of the milk teeth, and causing them to be absorbed, until, at length, losing all hold in the sockets, they fall out. The process of absorption commences here in the milk-tooth, and as much in the crown or body of it as at its root.

The process of general diminution seems now for awhile to be confined to the central teeth, and they gradually waste away until they are no larger in the body than crow-quills. About the expiration of the second year, or a little before, the milk teeth are pushed out of the way, and the two central permanent teeth appear.

This cut gives the mouth of a two-year old beast, the two permanent central incisors are coming up, and the other six milk teeth remain in place. The bone in front of the lower jaw is taken away, in order that the alveoli may be seen.

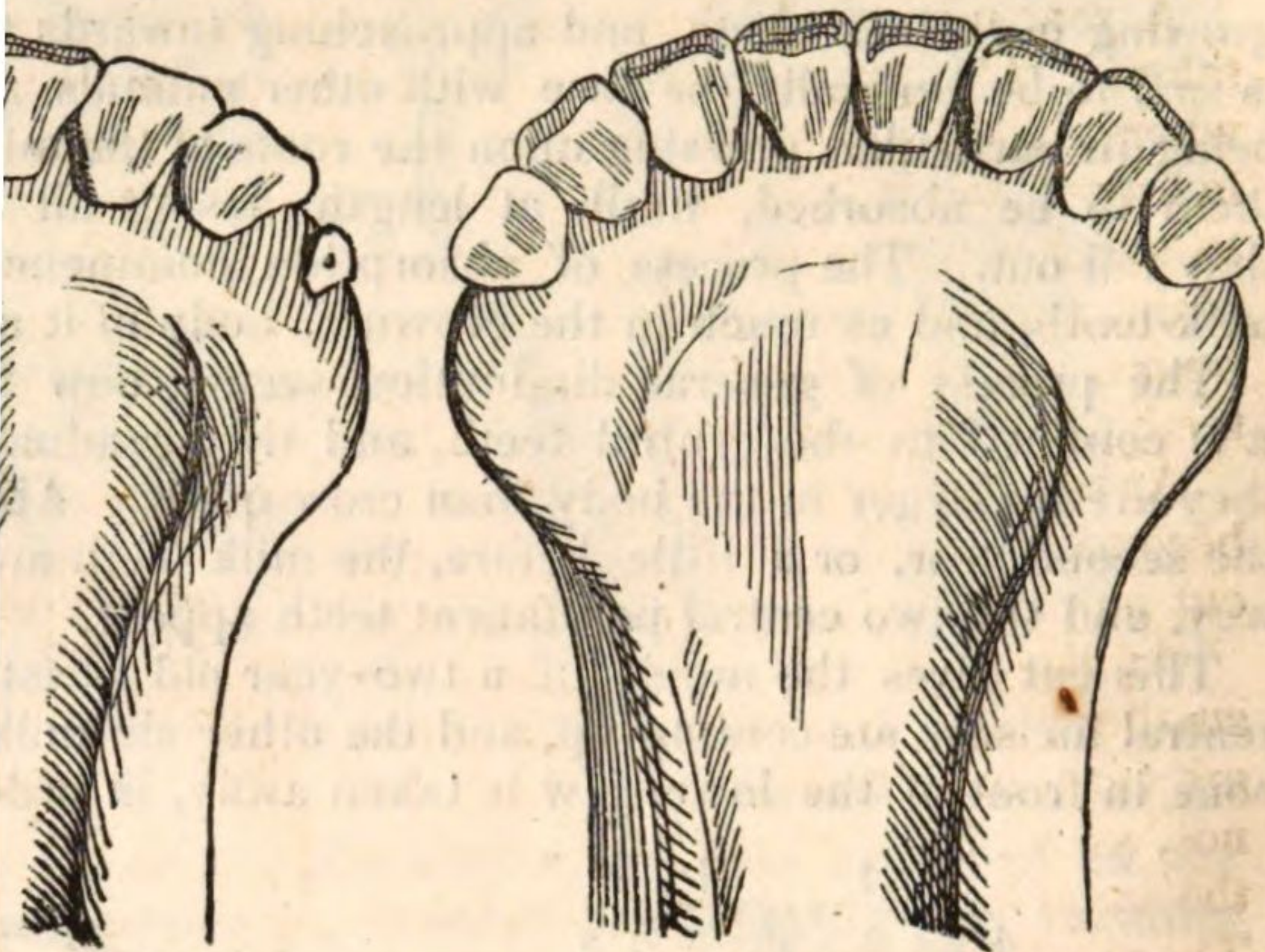


Two Years.



Three Years.

the tooth whose turn it was to go must be drawn
 outh then, as represented in this cut, should contain.
 rs and two milk teeth.



Years.

Five Years.

ement of the fifth year the eight permanent incisors
 corner ones will be small. This cut gives a five-year
 ap one a month or two after five years; so that the
 d to be *full-mouthed*, i. e., all the incisors fully up,
 old. It will be seen, however, in this mouth of five
 central pairs are beginning to be worn down at the
 a flat direction, or somewhat inclining towards the

the teeth are all fully grown, but this mark has extended
 and all the teeth are a little flattened at the top; while
 ones there begins to be a distinct darker line in the
 a line of harder bone*.

aware against what authority we are contending, when we thus
 tle by the appearance of the teeth. The pleasing author of the
 ral History" gives the beast a full mouth at three-years old, and
 Editor of the Encyclopædia Metropolitana. Mr. Parkinson says
 t four, although he acknowledges that the teeth are not perfectly
 six years old. We have no hesitation, however, in appealing to
 reeders of cattle, for the general accuracy of our account.

or two central pairs,—and which, at eight years, has spread over the six central incisors.

Six Years.

A year afterwards, however, a change takes place which cannot be taken. The process of absorption has again commenced, and where it did when the animal was four months old, viz., in the central incisors; but it is slow in its progress, and it is never carried to the extent to which we observed it in the milk teeth. It is, however, plain, and the two central teeth are evidently smaller than the others. A considerable change has also taken place on the surface of the teeth; the two dark marks are rubbed into one in all but the corner teeth.

At ten, the four central incisors are diminished in size, and the two outer ones becoming smaller and fainter. The cut represents the mouth at this age.

At eleven, the six central ones are smaller; and at twelve, all of them are very considerably diminished; but not, as we have already observed, to the same extent as in the young beast. The mark is now also faint, or nearly obliterated, except in the corner teeth, and the inside edge is worn down to the gum.

The beast is now getting old; the teeth continue to diminish, and it is not often that the animal, after fourteen or sixteen years old, is able to maintain his full condition. He must then be taken up and partly fed in the house: yet there are many instances in which favourite cows have been kept until they were more than twenty years old; and I have known a cow of the same age who pastures with the rest of the dairy, and gives a fair quantity of milk.

Some writers have asserted, that a good cow will usually continue to give milk until that age; but the dairyman would discover his error by observing the quantity and the quality of his milk, if he received it as a general rule. A good cow will continue to breed and give milk until twenty years of age. Mr. Watkinson, however, had a cow that for seventeen years gave from ten to twenty quarts of milk every day; was in moderate condition when taken up; six months in fattening; and, being then twenty years of age,



Ten Years.

rely be examined to ascertain the age of a beast. to be got at; and the same dependence cannot be. The calf is generally born with two molar teeth, and in each jaw above and below. The fourth appears at the eighth month, and the fifth at the end of the year the first molar is shed. The second is displaced the first year, and so with the rest, at intervals of a year; which is from the beginning a permanent tooth, does not appear till the sixth year.

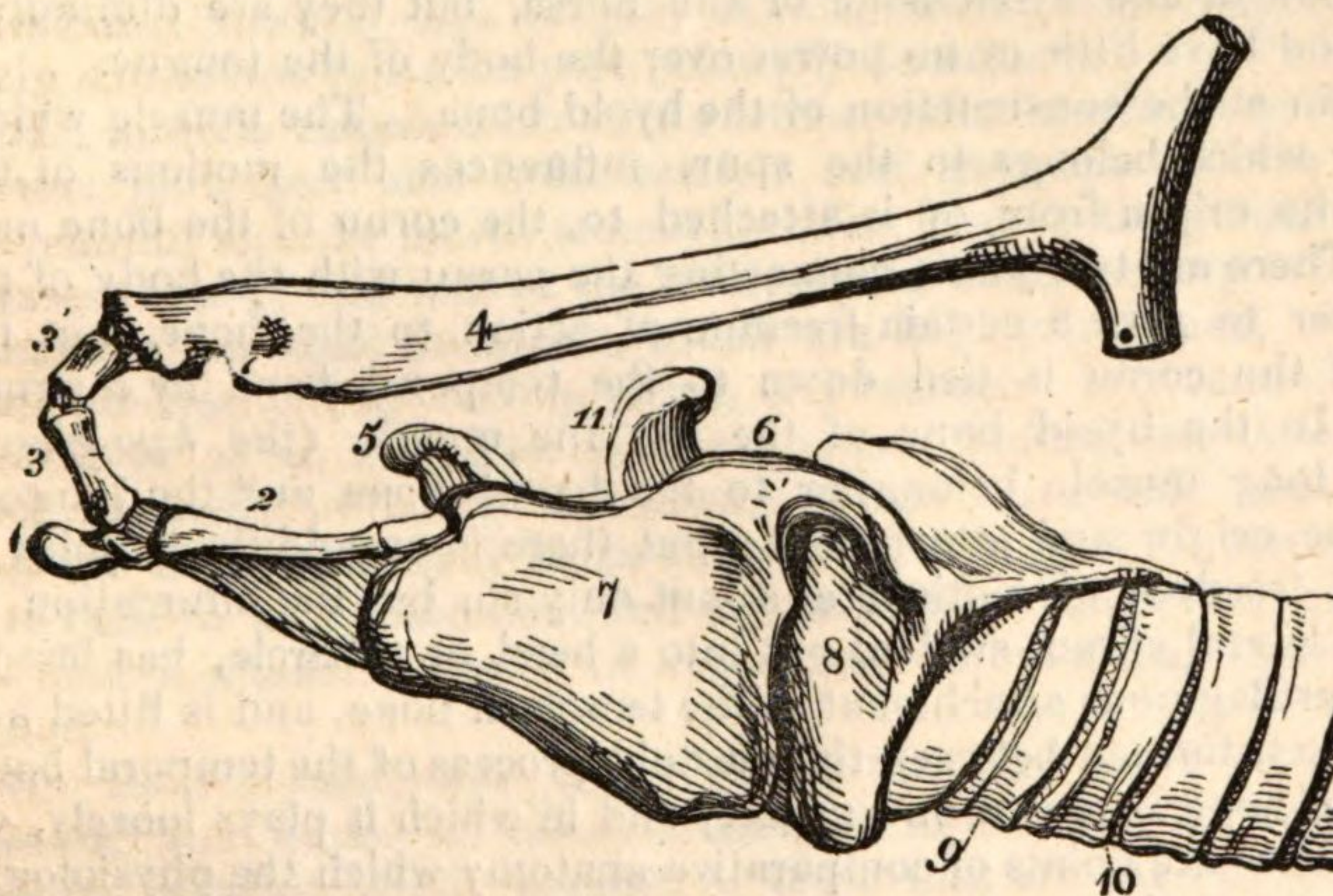
THE TONGUE.

The tongue is the base of the mouth. It is firmly held in its position principally derived from the os hyoides, a singular bone connected to the larynx. It is composed of the union of many muscles which extend their fibres through every part of it, and with a considerable quantity of fatty matter, which gives it a peculiar taste and appearance when cut into. It is a part of the mouth, but curiously modified; it resembles a scarf-skin, but the internal layer is fibrous and the external is a soft, reticulated substance which serves to protect it, or little eminences scattered all over the tongue, called papillae, are supposed to be the terminations of the gustatory branch of the fifth pair on which the sense of taste depends. The tongue, generally, is to dispose of the food during mastication; to collect it afterwards, and, by the bars, form it into a pellet for swallowing: it is used in drinking, and the canal through which the food passes in drinking. The outer covering of the tongue of the ox is of a whiteness and roughness not found on that of the horse. This roughness which the food is gathered renders this necessary; and the ox expresses his friendship for his companion by nibbling. When two cows will rub and rasp each other with their tongues two at a time.

The tongue, it answers other purposes; it helps to collect the food and form it into a roll before it is brought between the pads of the incisor teeth of the lower one; it serves to clean the mouth from any substances to which it is exposed by means of dirt or moisture. It also wipes from the nostril the filth that is discharged from the nose in diseases of the membrane of the nose or the air passages. The ox is so subject. The mouth is shorter than that of the horse, as it lies in the mouth, is shorter, and yet it is

1. The spur.
2. The basis, or greater cornu or horn.
3. The inferior lateral cornu.
4. The superior lateral cornu.
5. The epiglottis.
6. The arytænoid cartilage.

7. The thyroïd cartilage.
8. The cricoid cartilage.
9. Rings of the trachea.
10. The interposed ligamentous between the rings.
11. The Rimæ glottidis.



1. The spur.
2. The basis, or greater cornu or horn.
3. The inferior lateral cornu.
- 3'. The middle cornu.
4. The superior lateral cornu.
5. The epiglottis
6. The arytænoid cartilage.

7. The thyroïd cartilage.
8. The cricoid cartilage.
9. Rings of the trachea.
10. The interposed ligamentous between the rings.
11. The Rimæ glottidis, or entrance of the windpipe.

Of the support which the os hyoides, resembling the *Cupsilon*, gives to the larynx, and its connexion with all the most beautiful cartilaginous box in the common function of breathing.

Under the unequal pressure of the bit, it would be other, and be excoriated or lacerated by the teeth. The spur, or appendix of the hyoid bone, it forms in the bit may rest, and on which it may be worked. Hence the jaw, which even now is too often brutally could be exposed to yet more frequent and severe pressure, the tongue of the horse is thus confined. We see of the horse protruded from his mouth, except he is occupied in licking his manger.

Contrary to the ox which requires this confinement of the tongue, he has need of one possessing an extraordinary power. Look at the os hyoides of the ox. Its spur (1.) is a mere tubercle. There is no penetration or confinement of the tongue. The same muscles spring from it as from the hyoid bone of the horse, but they are diminutive and have little or no power over the body of the tongue.

Construction of the hyoid bone. The muscle which, attached to the spur, influences the motions of the bone, or is attached to, the cornu of the bone near the two joints connecting the cornu with the body of the bone, gives a certain freedom of action to the bone, but the muscle is tied down to the temporal bone by a strong ligament. In the hyoid bone of the ox, the muscle (the *hyo-glossus*) has its attachment belonging to the hyoid bone and the tongue) and attachment; but there is an additional joint to give it freedom of motion, and not only so, but the bifurcation of the cornu, swelled out into a head or tubercle, has lost its attachment to the temporal bone, and is fitted into a socket between the mastoid process of the temporal bone, and is held down on purpose, and in which it plays loosely, yet with freedom. Points of comparative anatomy which the physiologist will find interesting, and which will not be quite uninteresting to any one who observes the marks of design in the various works of Him

GLOSS-ANTHRAX OR BLAIN.

The tongue in cattle, which, from its sudden attack, and its frequently fatal termination, requires particular attention. The animal becomes dull, refuses his food, and rumination ceases. A swelling appears from the mouth; it is at first limpid and afterwards becomes purulent, bloody, and exceedingly foetid,

tongue, and even nearer to the top of it than to the inferior parts of it are the seats of disease. General inflammation speedily follows, and that part of it on which the ulcers first comes mortified, and may be cut into, or cut away, without expressing the least degree of pain. Incisions into the tongue followed by blood, but they bring to view tissues decomposed at some points, and black at others, and bearing the marks of incipient gangrene.

The primary seat of the disease is the membrane of the mouth, or above the tongue. As the sublingual glands lie along the side of the tongue, and their ducts open on the side of the membrane, a ligament under the tongue, it is possible that this disease may arise from, or be connected with, obstructions or inflammation of these glands. Dissection, however, has not proved this, but the membrane of the mouth seems to be the part primarily concerned.

Post mortem examination shows intense inflammation, or even gangrene of the part, and also inflammation and gangrene of the lungs, the paunch, and the fourth stomach. The food in the paunch is of an offensive smell; and that in the manyplus is hard and dry. It reaches to the small intestines, which are highly inflamed, with black patches in the cœcum, colon, and rectum. We cannot have confidence as to the cause of this disease; indeed, we believe in the great majority of cases, unknown. Some have said that it is more frequent in low, marshy lands than in others; that it attacks animals that have been in poor condition, and are suddenly changed to good condition, and that it oftener happens in spring and autumn than in the winter.

We have considerable doubt about this, for we have seen it in all seasons, and under all circumstances;—in the stall-fed cows of the metropolis, whether newly bought, or those that are used to the stall, and in the grazing pastures of the country. When it becomes epidemic, when many cases occur about the same time, and over a large extent of country, and in the town dairies as well as the country, it is usually in the spring or autumn. Most epidemics of an inflammatory character occur at those periods, for the process of moulting is then forward, and the animals are, to a certain degree, debilitated, and are more liable to inflammatory complaints; and these assume a low and then a malignant form, much oftener and much more speedily than in other domesticated animals. Our friend, Mr. Sewell, speaking of this disease, and of the prostration of strength by

judicious treatment of cattle which then prevailed. Improved by the suggestions of veterinary men, and when the disease remained, the predisposition was removed, and the disease was cured. It is singular, however, that although this is too generally the case, breeders of cattle have little to do with veterinary science, but their own antiquated recipes, or they have recourse to the uneducated cow-leech; and some veterinary schools, the system by which they climbed to a certain degree of reputation, neglect the study of the diseases of cattle—so curiously do they neglect.

Sometimes it assumes an epidemic character, we fear that it is not of its being *contagious*, and especially under the name of glanders in the horse, is not communicated by breath; but there must be actual contact. The disease is communicated by the same manger, or drink from the same trough, or by the saliva, in which the virus seems to reside, or by some abraded or mucous surface. The malady is easily communicated when animals graze in the same field, and the practitioner should be aware of this, and take necessary precaution.

It is justified in stating, that this is one of the maladies communicated from the brute to the human subject, and the number of cases is increasing. We are unwilling to excite unfounded alarm, but believe half the stories that are told us of herdsmen that are suffering under the blain, and becoming afflicted with it; but there are several accounts which are too true to be for a moment disputed. We relate one—A man took out of an ox with a silver spoon, in order to examine the many of the characteristic vesicles. He afterwards, without taking care about cleaning it, ate some broth with the same spoon. Days had elapsed, when his mouth felt sore, pustules appeared on the tongue, malignant fever succeeded, and he died. It was communicated at Nismes, in 1731, it was communicated, and it is now being, but to various species of domesticated animals. The origin of this epidemic was strangely accounted for. It was in autumn, after an exceedingly dry summer, and when the grass being burned up, were compelled to feed upon the ground covered with snails. The danger, however, so far as the human subject is concerned, is trifling, and easily avoided; and a man may take care to keep these animals without injury: *he has to take care that the edge from the mouth does not touch any sore place.*

it is quite sufficient if the vesicle is freely lanced. There will be an immediate discharge; the bladder was distended by a substance perfectly organized, or of such a glary or inspissated nature as to escape. If this operation is performed when the saliva first runs from the mouth, and before there is any unpleasant or greenish appearance, it will usually effect a perfect cure*. If examined four-and-twenty hours afterwards, the only vestige of disease will be an incision, not looking very healthy at first, but that will come so and heal.

Some rub a little salt well into the incision as soon as it is made, others apply a solution of alum. Either may be done, and the former is preferable, if the owner should appear to wish that something should be attempted, but neither of them is necessary. If the disease has made considerable progress, and the vesicles begin to have a greenish appearance, or perhaps some of them have broken, and the breath becoming very offensive, the mouth must be carefully examined.

* It is agreed, on all hands, that these vesicles must be opened. The lancet seems to us to be the most simple and effective method of opening them. Parkinson, however, whom we have often quoted with respect as a breeder of cattle, recommends the following injudicious and dangerous method. We allude to it, had we not reason to believe that, on the faith of his name, it is frequently practised. He says, 'Breeding and Management of Live Stock,' 'provide a cane or stick that will bend, long enough to reach into the stomach, of the animal; then take a piece of soft woollen cloth, or linen, but best, put into it some tow, soft hay, cotton, or wool, to the size of an egg, or larger, and tie it on the end of the stick, this being done, dip it in tar, and of the animal; with one hand take hold of the tongue, while with the other gently thrust the stick with the tar upon it down the throat into the stomach, and remain for about half a minute for the tar to dissolve and disperse, then draw it up, the slower the better, as wind will follow, which, in some cases, gives great relief. Repeat this three times, and the animal will be immediately relieved.'

Now for the rationale of all this: the effect to be produced, and on an animal scarcely able to breathe—distressed by the increased respiration produced by the motion, and in fact threatened with absolute suffocation every moment. 'The efficacy of the medicine, I apprehend, arises from thrusting the stick, or cloth, into the throat, *which breaks the bladders*, and it is for that reason I prefer flannel to tow, likely, in passing the root of the tongue, to have that effect; while the operation is nauseous, causes the animal to throw up a large quantity of thick saliva, and sneezing violently.'

We quote this passage not only to protest against a mode of treatment far more likely to kill than to cure; but also to shew the deplorable state of cattle medicine at the present time. The best of our authors on the breeding and management of live stock, and a man too, can write thus ridiculously.

several of the most fatal diseases to which they are
relatively little importance, and easily got rid of in the
neglect that produces all the danger. It does so here;
easily cured when attacked in its early state, be-
lieved neglected. We do not, however, mean to say
that of the blain, the disease should be always so
that the mere lancing of the vesicles should be the
but it should be the first thing done, and that on
the most dependence, as attacking the fountain-head of
and getting rid of the danger of suffocation at least.
to take its course, speedily becomes connected with
not long in taking on a typhoid form; even then
extract blood. Four, or five, or six quarts should be
to the size of the beast, and the urgency of the case;
bleed until we begin to perceive its effect on the

as constipation usually accompanies the commence-
ment, ever absent in cases of blain, we should administer
from a pound to a pound and a half of Epsom salts; and
give up some laxative injections.

Consequently, when treating on one of the first serious dis-
eases, protest against the unscientific, inefficient, beastly
use of purgatives, prevalent not only among the igno-
rance and possession of foolish nostrums that are to be found
among farmers, and some of them of the better sort,
every class of practitioners. If a beast is to have a
remedy ordered to be dissolved in a quart of human urine;
and not given for a few days, its horrible stench

There is something abominably disgraceful in all
that hereafter recommends it deserves to be drenched

Let the Epsom, or Glauber's, salts, or the com-
pounded dissolved in simple water or thin gruel. They want
to increase their effect.

Indifference and neglect of the farmer, the practitioner
until gangrenous ulcers fill the mouth, and the
lips, and the tongue itself, seem to be sloughing away
sores, have also begun to appear externally behind or
in front of all to be dreaded, and frequently accompany-
ing the blain, ulcers begin to break out about the feet, and
the falling out of the hair and the hoof, and threaten the loss

administered in powder, suspended in gruel; the half-pint home-brewed ale not being forgotten. Two drachms of g calumbo, and one of ginger, will constitute an average dose, a repeated morning and night

The practitioner should pay considerable attention to the food always that the appetite fails in this disease; nay, we have seen tanus, remain unimpaired to the last; but the soreness of the prevented the animal from either eating or ruminating. He should with gruel—some of it should always be within his reach, and occasionally sip no inconsiderable quantity of it. More should be poured down, or given by the stomach-pump—the latter being the best mode of administering it. When poured down bodily from the nostrils, it generally find its way into the rumen, and there it will be retained, and be in a manner lost; but when given from the small pipe of the trachea, and not too strongly forced on, it will trickle down the gullet, and pass on into the fourth, or true digesting stomach, and be converted into immediate nutriment.

There is reason to hope that this is one of the somewhat numerous diseases, under which the animal either cannot labour a second time, or to which the constitution betrays an evident insusceptibility for a considerable period. Cattle that have recovered from the blain afterwards purposely subjected to the danger of contagion, have no ill effect.

THRUSH IN THE MOUTH.

There is a disease, sometimes an epidemic, and especially in autumn and winter, when the weather is unusually cold and wet, to which the name is sometimes mistakenly given, and we believe has been so, for gloss-anthrax or blain consists in the appearance of pustules, or sometimes vesicles, along the side, and at the root of the tongue, but all over the mouth, and occasionally even on the outside of the lips. These pustules or minute ulcers succeed, which may run a little into each other, but oftener speedily heal. Some persons have taken to themselves a great deal of credit for the treatment of these supposed cases of blain.

This is a very harmless affair. There is sometimes a slight fever, but rarely such as to interfere with the appetite, and never to indicate danger. The disease may last for ten days, or a fortnight more; but it gradually yields to a few mild doses of physic; and it is thought that the beast thrives the better afterwards for having had something that was oppressive to the constitution.

which extends from the root of the ear to the angle of the mouth, consists of a vast number of little glands connected together, each having its minute duct to convey away the secreted matter, and these ducts communicating with one another to form one main branch, termed the salivary duct, into which the united stream is conveyed into the mouth. This will give the reader a sufficient notion of the situation of the salivary gland, and also of the blood-vessels of the neck, and of the upper part of it. It may be compared with the Horse's.

(The trapezius-shaped) muscle occupying almost the whole of the back of the neck, and extending from the parietal ridge, as far as the fifth vertebræ of the back. It arises in the ox by the atlas and the other from the mastoid process of the occipital bone.



It is attached superiorly by tendinous and fleshy fibres to the occipital bone, and inferiorly by fleshy fibres to the transverse processes of the neck, and the fore-part of the spine. There is a branch of the nerve on each side of the neck. When they act together they erect

lies principally below ; so it is in almost all ruminants, and particularly in the deer tribe ; and therefore these muscles are considerably larger in the ox than in the horse.

4. A portion of the *levator humeri* (the elevator of the arm) reveals an important muscle occupies the same situation in the ox as in the horse, as seen in its proper place at *b*, p. 119, 'Horse.' It arises by an aponeurotic expansion from the parietal ridge, and by a strong tendon, from the styloid process of the temporal bone, and from the four first bones of the neck, and, connecting itself with the ligament of the neck, it goes to the scapula of the shoulders and the upper bone of the arm. When the head is fixed at a fixed point, one of them, acting alone, draws forward the shoulder and the arm ; when the shoulder is made the fixed point, it turns the head and neck ; or, the shoulder still being the fixed point, and both the head and neck, the head is depressed. This muscle is much larger in the ox than in the horse, and presents to the comparative anatomist and to the student some important points of difference. It is more decidedly connected with the *rhomboideus longus* (the long rhomboid-shaped muscle of the neck) in the horse, and evidently contributes materially to the formation of the sub-cutaneous muscular fibres, which are substituted for the pectoral cutaneous muscle of the neck. Inferiorly it is divided into three parts :—the one, thin and inferior, goes to the anterior extremity of the scapula ; the second, at the inferior part of the arm, furnishes a tendon which is inserted with that of the *pectoralis transversus* (the transverse muscle of the chest) into the humerus ; while the superior division gives a tendinous expansion, which spreads over, and loses itself upon the anterior face of the humerus. It may well, therefore, be a larger and more useful muscle than in the horse.

5. The *sub-scapulo hyoideus* (belonging to the substance of the scapula, the shoulder, and to the hyoid bone), from the shoulder-blade to the anterior end of the hyoid bone, to draw backward that bone, considerably larger in the ox than in the horse.

6. *Sterno-maxillaris* (belonging to the sternum and the lower jaw) arises from the cartilage in front of the chest to the angle of the mouth, and is considerably smaller than in the horse, but contrived to answer to the peculiar wants of the animal. It is attached to the lower jaw by means of a bifurcated tendon, as beautifully shewn in this dissection. The posterior branch is inserted into the masseter muscle, on which it acts as a kind of bridle in the usual process of mastication, particularly as tending to limit the lateral and grinding motions of that muscle. The other goes on and attaches itself to the

(the muscle by which the human being blows the
om the alveolar borders of the upper and under
eeks, and the membrane of the mouth, and to the

It tightens the membrane of the mouth, and thus
the disposal of the food in the mouth, and also in
of the mouth.

he *os hyoides*.

illaris, from the styloid process of the occipital bone,
wer jaw, to draw it backward, and to open it. There
rences in the structure and connexion of this muscle
se, but they would be difficult to explain in a work

f the stylo-maxillaris, which is called the *digastric*,
is seen here

muscle, the *stylo-hyoides*, is here represented, but
the horse; extending from the styloid process of the
e of the corner of the hyoid bone, and its action con-
g and elevating of the corner of that bone.

he larynx.

land (the gland in the neighbourhood of the ear),
reversed, to shew the parts beneath

uct winding within the angle of the jaw, and escaping
distance (its course within the jaw not being one-half
horse), and in company with the maxillary vein and
e cheek, and perforating the buccinator muscle, in
s contents into the mouth. The orifice is generally
d or fourth grinder. The situation of the duct, so
y than in the horse, should be carefully observed, for
of this duct is far more frequent in the ox than in
ions of various kinds may be necessary.

lary gland (the gland under the jaw), placed more
than in the horse. Its commencement is almost as
parotid, but behind it; thence it reaches down to the
l there begins to take a direction forward between the
r jaw, and terminates in a duct which opens on either
f the tongue.

nds (glands containing lymph) of the neck, placed

nds found between the branches of the lower jaw;
the sub-maxillary, nor sublingual glands, but often
n. They become inflamed and enlarged in almost

A bleeding from this branch is practicable in the horse, and is desirable when it is our object, as in cases of staggers, to get as much as possible from the brain; but in the ox, it is so near the parotid gland, that it would be difficult to open it there. The gland is sometimes completely covered by the parotid gland. We must be always content with bleeding below the division of the jugular.

23. The *temporal vein* (the vein of the temple).

24. The trunk of the *parotidean* and *auricular* veins (the vein of the parotid gland and of the ear).

25. The *internal jugular*, and particularly its passage below the sterno-hyoideus muscle. The path of the internal jugular by the side of the carotid, under that muscle, is marked by a dotted line.

26. The *carotid artery* (so called because a ligature of it was found to produce sleepiness or coma), where it emerges from below the sterno-hyoideus muscle. Its path under that muscle, by the side of the jugular, is also marked by a dotted line, showing the connexion of the vessels. The figures are placed at the spot where it would be most convenient to operate, if circumstances should require that a ligature be passed round the carotid.

27. The *sub-maxillary artery* given off from the main trunk of the carotid, running its course anteriorly, to bury itself beneath the angle of the lower jaw. It is afterwards seen emerging from under that bone, and running with the sub-maxillary vein, and the parotid duct, and being the middle of the three. It will be observed that, on account of there being a convexity of the lower jaw in cattle, the sub-maxillary artery emerges from under the jaw, and mounts the cheek more than two inches higher than it does in the horse, and, therefore, the place at which the pulse is ascertained in cattle is removed thus much farther from the jaw, even at that place the artery will not always be distinctly felt, on account of the peculiar and double insertion of the sterno-maxillaris in cattle (vid. fig. 6 in this cut), and also because the artery is, in cattle, buried behind the angle of the jaw.

28. The *temporal artery* at which the pulse may often be examined.

29. One of the arteries supplying the parotid gland.

30. The *eighth pair of nerves*, or the motor organic nerves.

31. One of the *linguales*, or nerves by means of which the tongue is moved.

INFLAMMATION OF THE PAROTID GLAND

The parotid gland, in cattle, is very subject to inflammation.

terized by the expressive term of *strangullion*. the parotid gland extends oftener and more rapidly wards, reaching the throat, and pressing upon all the s. When there is much swelling, suppuration and, and should be encouraged by diligent fomentation; fluctuation can be detected, the tumour should be freely ill then readily escape, and the abscess fill up: but if red to burst, ulcers will be formed, exceedingly difficult will too often run on to gangrene. It is a singular flesh of the ox is one of the supports of human life, ites more or healthier nutriment, there is no animal in lcers are so frequently formed, or in which they are so nant. From inflammation, apparently of only an in- of the parotid gland, we have known ulcers of the cter extend from ear to ear, and expose the most im- ie upper part of the neck.

is to be combated, like all others, by fomentations, occasionally, blisters, in the early stage; bleeding and resorted to according to the degree of general fever; as formed, the chloride of lime must be used to arrest grene, and the tincture of aloes to heal the part after abscess. Mild purgatives will be very useful, each of matic or tonic medicine.

the passage of the saliva will sometimes occur in the ensue at the place of obstruction; and, at length, the accumulate, will burst the vessel, and a fistulous ulcer Personal examination alone will indicate the course to a case, but the care of an expert veterinarian will be

THE SUB-MAXILLARY GLANDS.

of the saliva is from the *sub-maxillary glands*. The y gland is seen at fig. 17 (p. 332), even posterior to The direction within the branches of the jaw is also there is a continuation of glandular substance, or a glands extending on either side within the branches of on duct from all of which pierces through the sub- the tongue, and opens on either side of the frænum. of the duct is particularly evident in cattle, and is very d; a cartilaginous plate doubles upon itself, and serves of, to the little teat-like orifice of the duct.

the day, while any unpleasant smell is perceived. To this with alum-wash, or an infusion of catechu, the manner of preparing be found in the list of medicines at the end of the work.

THE SUBLINGUAL GLANDS.

The third source of the saliva is from numerous glands scattered over the membrane of the mouth generally, but principally collected under the tongue, and therefore called the *sublingual glands*. They consist of small collections of glands, with minute openings into the mouth, but which also a little enlarge, when there is tenderness or inflammation in the mouth. No harm can ever come of these glands if the cow-leech does not make it. On every part of the lips these little glands are found; and the quantity of saliva obtained from all of these, especially when they are excited to action in mastication or rumination, is very great.

THE VELUM PALATI, OR SOFT PALATE.

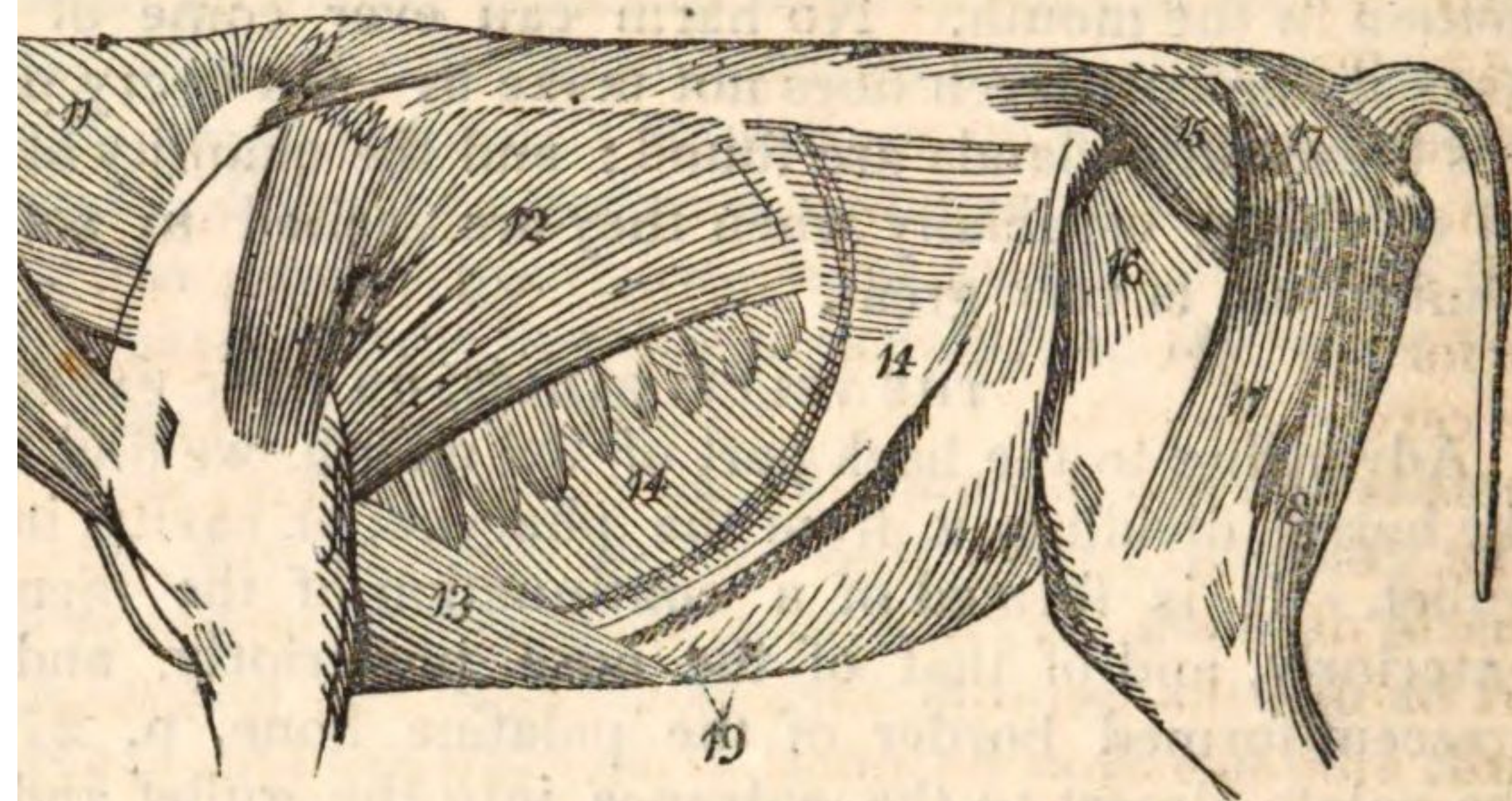
Advancing to the back part of the mouth, we find the same structure in the horse, dividing it from the pharynx, or cavity, immediately behind the gullet. It is formed of a continuation of the membrane of the mouth anteriorly, and of that of the nose posteriorly, and it hangs down from the crescent-formed border of the palatine bone, p. 273. It reaches to the palate almost to the entrance into the gullet and wind-pipe. In the horse it does quite so; it hangs upon the back of the tongue, and the glottis, and therefore all communication between the mouth and the wind-pipe is cut off, and the horse can breathe only through his nose. This curtain is so contrived as to yield to any pressure from behind, to resist that which comes from behind, the food passes under it to the stomach, but cannot return, and therefore also when vomiting occurs in a horse, the food is returned through the nose. In the ox, however, reaching quite so low, the horse breathes through the mouth, and the food is returned to the mouth in the natural process of rumination, and vomiting, when, and which occurs very rarely indeed, that process takes place, or, at least, regurgitation from the rumen, for we never see whether true vomiting, or the return of food from the fourth stomach, is ever seen in cattle.

THE PHARYNX.

The food having passed beneath this soft palate, reaches a further cavity between the mouth and the gullet and windpipe. It is a membrane full of little glands that pour out a viscid fluid, by which the pellet of food is covered and prepared to pass more readily.

AND DISEASES OF THE NECK AND CHEST.

and the proper conformation of these parts, differing do in a kindly feeding and an unprofitable beast, and in various breeds, each excellent in its way, we have two anatomical plates, which we will contrive so as far as possible, the whole muscular system of the ox.



s (the ring-shaped muscle of the mouth). This is in the border of the lips, and constituting their principal thickness, forming two semi-ovals, and united together the lips. It is much larger in the ox than in the horse, because the lips are more tendinous fibres, because the lips are more in the ox than in the horse, in grasping and assisting food.

the upper lip, and angle of the nose. This muscle is much larger in the ox than in the horse, because the lips are not used to grasp things as in the horse; and the ox is not a beast of rapid and extensive dilatation of the nostrils: to which there are no false nostrils in the ox to be dilated, and the muscle is principally employed in the horse.

mus (arising near the yoke-formed arch under which the trachea passes) lies along the middle of the side of the face; its motion of the lips, and particularly in retracting the lower lip, this is particularly developed in the ox, for it has much use of the food.

those of the horse rarely discharge,—viz., to defend the eyes from

9. The different portions of the *levator humeri*, through the their course: the upper part of this muscle was described at p. 333. In the horse the form of the lower part of the neck principally depends on the muscle, which is much more developed in some breeds than in others; but it is larger at its inferior insertions than it is in the horse. However, in a deer-like we may wish the neck of a favourite ox to be at the bottom of the head, we look for plenty of muscle at the bottom of it, or we have neither strength nor substance in any part of the animal.

10. The *sterno-maxillaris*, described at p. 333.

11. The *trapezius* (the quadrilateral muscle). This muscle is united with the *rhomboides longus*, and forms the exterior muscle of the neck immediately below the integument, and above the *splenius*. (See also the next Cut.) On this, and on the *splenius* beneath, depends the form of the upper part of the neck and withers, and, in some breeds, the cervical portion of it is particularly fine. The combined action of the whole is to raise the scapula, and draw the bone forwards.

12. The *latissimus dorsi*, so called from its extent, being the largest muscle of the back, and reaching over the whole of the upper part behind the scapula, of which bone it is a muscle, drawing it forward, and elevating its inferior extremity. It is thinner in the horse, except that much adipose matter insinuates itself between its fibres, and gives it a false appearance of substance. In fact, it does less work to do than in the horse.

13. The *pectoralis major* (the larger pectoral muscle). It is the only pectoral muscle, properly so speaking, for the minor is not. There are, however, the transverse pectorals, of which we shall not account presently. From the ensiform cartilage at the termination of the true ribs, and even from the external oblique muscle of the belly, it draws forward, strongly attaching itself to the fourth, fifth, and sixth ribs, the sternum, and also to the lesser tubercle of the humerus, and to a part of the end of the scapula or shoulder-blade. It draws the scapula into an upright position. This muscle is considerably smaller than in the horse, because it has not the work to do.

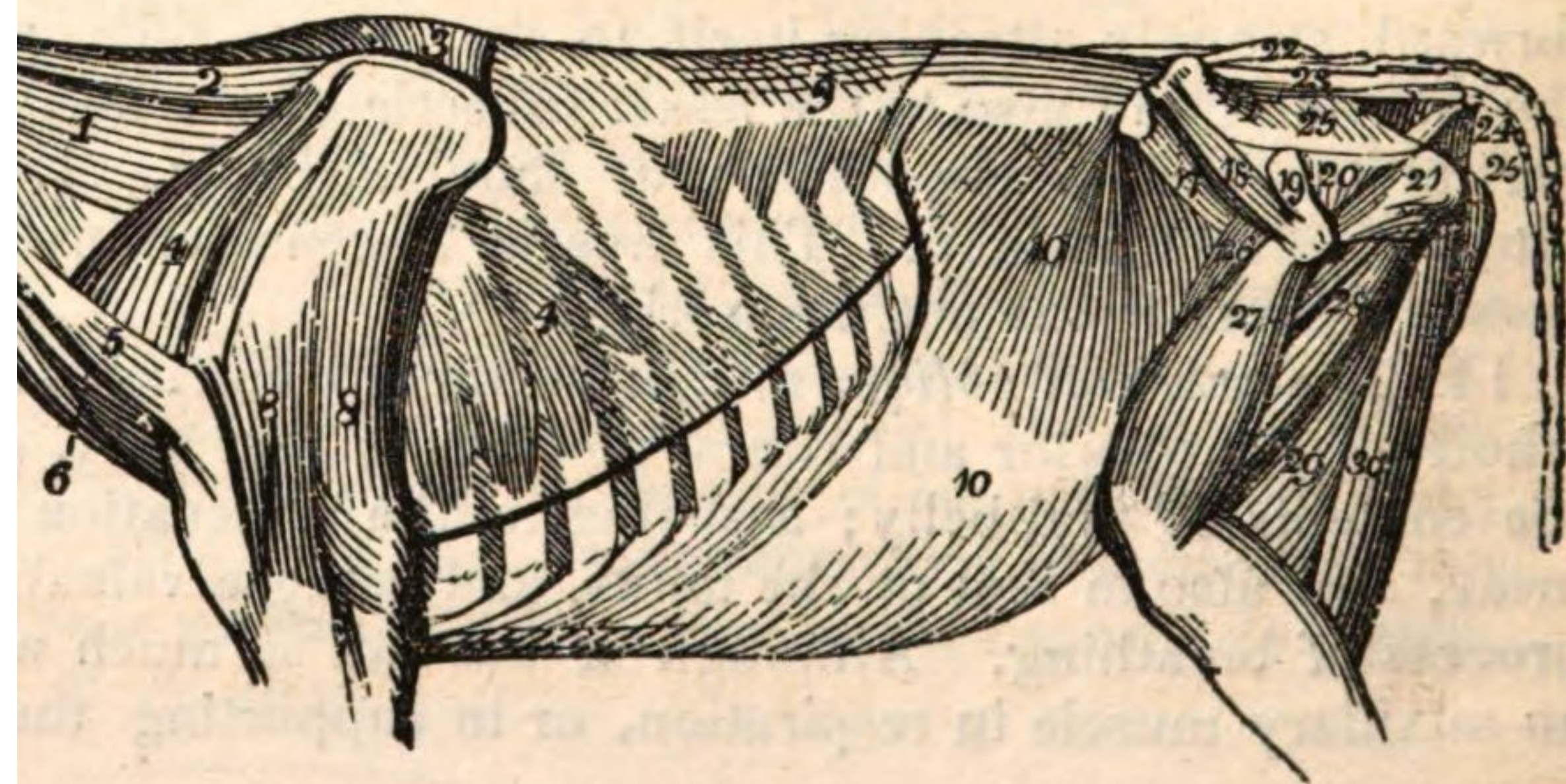
14. The *external oblique* muscle of the abdomen. It extends over the whole of the inferior and lateral portions of the belly, giving support to the contents of the belly; assisting in the evacuation of the faeces, urine, and also in that of the foetus, and being a valuable auxiliary in the process of breathing. Although it has not so much work to perform as an auxiliary muscle in respiration, or in supporting the abdomen.

almost as well as any horse, and Mr. Perkins's Nagore restrained by any fence, no great speed is usually required do they want the sudden and powerful flexion of sometimes demanded from the horse. This muscle is in cattle by raising the aponeurotic expansion of the is concealed superiorly and posteriorly by the *promitendinosus* muscle.

This muscle, although we have termed it a *fascia* or y and tendinous expansion over the whole of the anterior of the thigh, whence it spreads below the stifle. Its then the muscles beneath; but, beside this, it assists the on the thigh, and the flexion of the thigh on the pelvis. ive and thicker muscle in cattle than in the horse. Its vided into two, and its tendinous expansion extends over he quarters, and unites with the principal flexor muscle *adductor magnus*. This is a part of the beast where of muscle and fat, and the cloddy buttocks of the first g passed away, we can hardly find quarters too long ped.

biceps femoris, or two-headed muscle of the thigh. In the l above to the spine of the sacrum, and to some of the tail, and below by one head to the patella or bone of another extending to the tibia, and the fascia covering the leg upon the thigh, and contributes to turn the leg, it has no spinal prolongation, and it does not ascend tuberosity.

a belonging to the sub-cutaneous abdominal vein.



muscles, or those by which the shoulder of the animal is attached to the trunk, and the weight of the trunk supported). These muscles under are more numerous in the ox than in the horse, and are more separated from each other by cellular and adipose matter. The attachment which the rapid motion of the horse sometimes requires, is not wanted, but the accumulation of flesh and fat goes on as far as it can. The serrated muscles are seen prolonged upon the side of the shoulder.

5. One of the insertions of the *levator humeri*.

6. A portion of the *serratus* muscle, occupying the posterior portion of the neck, where the neck emerges from, or enters the chest. This, in every breed of cattle, is much larger than in the horse, indeed, it is altogether a different muscle, or it is the union of two or three muscles, particularly one lying across the ribs. It is composed of a long band, larger posteriorly, with its origin about the middle of the fourth rib, and spreads forward to three anterior ribs, and even to the vertebræ of the withers.

7. Another head of the *levator humeri*.

8. The *Triceps extensor brachii*, or three-headed extensor. Two of the portions are here seen, the one from the external part of the shoulder to the outer tubercle on the bone of the arm, and the other occupying the space between the shoulder-blade and the bone of the arm; the latter has its principal lower insertion in the posterior and superior part of the arm. There is a third portion on the interior of the scapula and the arm. The action of the compound muscle is evidently to extend the humerus, or bone of the arm, on the shoulder-blade, and to throw forward the lower part of the limb. These muscles are in a very marked degree, smaller in cattle than they are in the horse, for these evident reasons, that the same strength is not required in a beast of burden, and much seldomer his speed being taxed, and because needless accumulation of flesh here would be in a part where it is coarsest and least valuable. The diminution on the external part of the shoulder, and the accumulation of adipose matter between it and the trunk being the reverse of what is seen in the horse, are apt illustrations of the skill with which he is adapted to his destiny.

9. Another portion of the *serrated* muscles, belonging to the ribs. These are principally muscles of respiration; they extend

bone and the upper part of the round.

utæi muscles lie on the upper and outer parts of the or deficient form of the quarters depend upon them. the horse, as indicating the strength of the quarters. the ox, as indicating the general muscularity of the however, be carried too far, and it used to be in the

In the horse, in whom they have so much to do, se and fibrous ; but, contributing to the formation of rtain degree, of the round, they constitute some of t valuable parts of the ox.

pear-shaped) muscle, found within the cavity of the inside of the aitch-bone and the rump. Small and ; much larger, and composed of softer fibres, in the sist in the extension of the haunch.

brevis (the shorter elevator of the tail), of which atiful use, when, in the moment of excitement, he tail arched : it is used in common with other muscles ets which annoy the animal.

longus (the long elevator of the tail). æ, by which the tail is pressed upon the haunch, and force that would scarcely be thought possible.

versal muscles, whose oblique fibres run from the e bones of the tail, through its whole extent, and by ons are affected. By the union of all of these muscles st effective instrument in driving away or destroying blood-suckers, by which the animal would otherwise

not so large or so strong in the ox as in the horse.

oris, or straight muscle of the thigh, runs along the portion of the thigh, from the ilium, to the patella, or ry conspicuous muscle in the round, and helps to advance the haunch. This muscle, however, is not n the horse.

les, so called from their occupying the greater part hree branches are much more distinct than in the t so much developed, for they have not the work to nks, and very truly, that there is a great difference f the beast that has worked, and of another that has and he is very right, for nothing tends so much to e muscular system as regular exercise.

do it without being too dryly anatomical, into the consideration of the bones and structure of the neck and trunk of cattle; and particularly connected with the two grand purposes for which they are bred—tho of milk while living, and animal food when dead

DESCRIPTION OF THE NECK.

The neck of the ox (see cut of skeleton, p. 272) is composed of bones, possessing the same relative situation, and distinguished by the same names, as in the horse. (See p. 63, 'Horse.') Let us take a rapid glance at the neck of the horse. Observe the long chain of vertebrae, each small, compared with the length of the chain—smooth—so disposed as to assume an arched form,—and the head so set on, that pressure is bearing upon the lower part of it, the mouth, and in the direction of vision is modified and assisted by every varying bend of the arch of the neck. I cannot look at it for a moment without being convinced that the whole is in view, and which are beautifully accomplished, were gracefulness, facility of motion, and the perfect play of elasticity. In the hands of the rider or driver must, after all, bear a portion of the weight of the guidance and management of the whole machine, even when the machine is contrived, that that weight shall be scarcely felt, and that the strength of the horse may often be safely managed by the child.

Now, let us observe the neck of the animal that is the subject of the present Treatise—an animal valuable, but for other purposes than the shortness of the neck generally—the shortness, and yet the strength of every bone—the avoidance of the comparatively smooth surface which we have observed in the horse, and the springing out, above and on one side and the other, of processes which, although in the horse, are neither so long nor so broad, nor so roughened by the bony proudly-arched crest which we admired so much in the horse, is vanished; or rather, if it exists at all, it is reversed: while the head is on in a ten-times more awkward manner than we find it in the determined star-gazer. Pleasure of riding or driving can never for a moment, be associated with such an animal; and there is no freedom of movement about the whole of this part of the machine. The ox is ridden in the interior of India. It is because they are the only beasts of the country, and few horses are there; and, after all, they are used for nothing else than the conveyance of despatches, in which the superior consideration consults the ease or comfort of the messenger; or for the

a form of the neck may be traced in the Devon ox, and to his appearance or his actual value; although com- have determined that the line from the horns to the y deviate from that of the back. Is this trait of the here appearing in cattle, connected with that activity s breed has ever been unrivalled? This form of the age in the cut of Lord Western's working Devon ox, n. The Sussex, and Hereford, and Pembroke, and all the Scots, horned or humbled, have, occasionally of the forehead; and we must be permitted still to neck, as one of the characteristics, and no defect, of o, in particular districts, and for particular purposes, be duly valued, when the triumph of the short

a little further than this, and claim the rising crest as every good bull of every breed. It shall be, what, in it perhaps is, nothing more than an accumulation of nt of the neck, and the *splenius* and *complexus* ates that broad base of muscle beneath—that bulk so indicative of the true masculine character. We all (p. 13), to whom, indeed, it belongs, in virtue of refer, also, to the West Highland bull (p. 65), who it, and also to the Old Craven bull (p. 189); to the . 196), and even to the short-horned bull (p. 242); et the Nagore bull (p. 268), who to the arched form h of the beauty which he actually possesses, notwith- hump upon his shoulders.

f muscle, however, in any part of the ox is not so extended and roughened surfaces would lead us to or the insertion of the muscle, may be spread over the bone; but we have not proceeded far in our muscle, before we find that its structure, at least in the so compact as that of the horse. A great deal more substance is inserted, not only between the different mus- tle divisions or bundles of which each muscle is com- tween the very fibres of the muscle itself; and that to t in a well-fatted beast it is almost impossible to meet le. The whole is *marled*—streaks of fat enclosed in n parallel with almost every fibre. This, at least, is breeds of cattle; and it was one of the greatest

man, nevertheless, deserved the thanks of the Devonshire first stealthily introduced one cross with the Hereford; he finished this fineness of the neck, but he did not impair the growth of the animal: he did not lessen his activity in the slightest; he increased his size, and his aptitude to fatten, too.

In the Ayrshire cow of twenty years ago we had a specimen to which a clean neck and throat might be carried, perhaps, diminishing at all the milking properties; but, we apprehended, to the disadvantage of the farmer when her milking days came. This prejudice in favour of the small neck led the farmer even to choose their dairy-bulls according to the feminine aspect of their heads. Perhaps the disparity of size which then existed between the northern and southern cattle might somewhat justify them in choosing a variety of the new breed. This, however, having passed over to the Ayrshire breeder, still fond of a neck finely shaped towards the head, he produced one a great deal thicker towards the shoulder and this not interfering, as experience has now taught him, with the best qualities of the animal, while it gave an earnest of aptitude to fatten towards the hind-quarters.

Mr. Marshall, when describing the new Leicester breed, speaks of the *fore-end* being long, but light to a degree of elegance; the neck clean, and the head fine; the shoulders remarkably fine to bone, *but thickly covered with flesh, and not the smallest of bone discernible.* He also thus speaks of Mr. Fowler's celebrated Shakspeare:—'His head, chap, and neck were remarkably fine, but his chest was extraordinarily deep, and his brisket down to the knees.'

The present improved short-horn, in his state of greater bulk and unnatural fatness, has, or ought to have, a tendency to finish the neck, at the setting on of the head, however that neck may increase in bulk, and, in the opinion of some, give too great bulk to the fore-quarters.

The *splenius*, *trapezius*, and *complexus* muscles are those most to do with the usual bulk of the superior part of the neck, with that which it may attain under the process of fattening. The *splenius* may be seen at fig. 1, p. 332; the *trapezius* is at fig. 11, p. 339; and the *rhomboideus longus*, with which the *splenius* is united in the ox, is brought into view at fig. 3, p. 341. The *trapezius major* is situated under them. Some of it rises as low as the transverse processes of the four or five first bones of the back, and

descends, or we shall have a general lightness of
er the animal comparatively worthless as a grazing

cles, however, placed under the *complexus*—viz.
nd the large and small *recti* and *oblique* muscles,
d motion of the head, which have comparatively
than in the horse, and contribute materially to the

THE ARTERIES OF THE NECK.

neck we should describe the principal blood-vessels
view in the cut at p. 332. The *carotid artery* (fig. 26,
ome of its ramifications, are the only arteries that we

The carotid artery on either side, as in the horse,
rt—escapes from the chest with the windpipe and
aching the windpipe, and clinging to its posterior
ck, supplying the different parts with blood, until it
here it divides into two branches—the external and
al ramifies over the face and external part of the
ters the skull, and is the main source whence the
ial blood. Smaller streams are sent to the brain
ies, which, defended and partly concealed in canals
bones of the neck, after having fed the neighbour-
pend the remainder on the brain, entering by the
h which the spinal chord escapes. A third and
g the main trunk high up in the neck, sends a
n, under the title of the occipital artery.

very few, if any, cases in which it would be either
to bleed from an artery in the ox. The temporal,
out not quite justifiably, open in the horse, is, in a
each in the ox; and the artery of the forehead,
n the horse, is so defended by its bony canal,
t; besides which, in bleeding from an artery, there
e difficulty either in getting the quantity of blood
ccount of the contraction of the vessel, or of stop-
f the blood flowed freely. We will, therefore, only
ical points of difference, of which it is possible that
y rarely, be taken in a practical point of view.

tance which will strike every one who compares the
horse and the ox, and that is,—with the exception of

lower jaw, whence it speedily emerges again, and much closer to the jaw than in the horse. This should be remembered when we feel for the pulse; for many a beginner has felt himself a little mortified when he could not find the vessel in what he supposed was its proper place, sometimes could not find it at all. It occurs under some circumstances, that even in the horse it is difficult, or impossible, to feel the pulse at the jaw. This is oftener the case in the ox, from various circumstances that have already been explained, and should, therefore, lead us to go at once to the side when there is any difficulty about the pulse.

The *temporal artery* is much larger in the ox than in the horse, as it has a greater surface to ramify upon and to feed: the figure shows out the spot at which the pulse will usually be most conveniently felt.

The *anterior auricular artery* is also large in the ox. It supplies not only the anterior muscles of the ear, but also the temporal muscles, and is indeed, so developed as that of the horse, but deeply lodged in the temporal fossa. The pulse may be very readily felt by means of it, and more readily than from the temporal.

The *superciliary artery*, escaping from the foramen above the eye, is a considerable one. It forms two branches, of which one goes to the root of the horn, and contributes to the vascularity and nutrition of that part. The other descends downward, on the side of the face.

The *occipital artery* is smaller than in the horse: the brain which a branch of this artery supplies, is but one half as large as that of the horse.

. THE VEINS OF THE NECK.

We here recognize the two jugulars which are found in most animals but not in the horse. The smaller, or *internal jugular* (fig. 25), is deeply seated, and no practical advantage can be taken of it. It is known, that in inflammation and loss of the external vein from any cause, the return of the blood from that side of the face and head is facilitated by the internal one: but even in the horse little injury is sustained by the loss of the external jugular, for nature is wonderfully ingenious in making provision for carrying on the circulation.

BLEEDING.

The jugular is, by common consent, adopted as the usual vessel for bleeding cattle. The vessel is easily got at; it is large, and can be missed by the clumsiest operator. The strap round the neck

is so much thicker than that of the horse, and the edge so apt to turn, that it requires a little experience and tact to attain certainty and safety.

action of blood from the ox, and especially at the commencement of a disease, or while inflammation runs high, the rule is the same as in the horse,—viz., to let the blood flow until the pulse plainly indicates that the circulation is affected. All other bleeding is worse than doing nothing, as it weakens the strength of the constitution, and leaving the system unimpaired.

as bad necks in cattle after bleeding, as in the horse, but is not so common. They must be treated in the same way, by the application of emollient lotions at first, and when these fail, the application of heated iron to the lips of the wound; or, in very bad cases, the application of setons, or the injection of the zinc-wash into the

BLEEDING PLACES.

operation of the mouth, or the nasal passages, should demand caution. In cattle, cattle may be bled from the *palatine vessels*. If the incision is made deep enough, plenty of blood will be obtained. The *jugular*, and the *saphena* veins behind, are proper places for bleeding, but some say the *milk*, or *sub-cutaneous abdominal* veins. The *milk* vein is large enough for the speedy abstraction of any quantity of blood in the shortest period; and if it were not a little awkward to get at, it is occasionally used, but the jugular is the most convenient in particular cases; and the only question is, whether any quantity of blood can be obtained by opening the sub-cutaneous abdominal.

THE MILK, OR SUB-CUTANEOUS ABDOMINAL VEIN.

Let us briefly inquire into this. Professor Girard, in his excellent work, 'Domesticated Quadrupeds,' thus describes the milk vein, or, as he terms it, the *subcutaneous abdominal*, lying immediately beneath the skin and passing over the belly. 'This vein, the sub-cutaneous abdominal, comes into view under the abdomen, at the commencement of the cartilaginous circle of the false ribs. It emerges from two openings, (the situation of which is pointed out by fig. 18, in the plates), approaches, on either side, the mesian line of the abdomen, and, half between the thighs, it pursues its course towards the inguinal region. Sometimes it unites with the superpubian vein, and occasionally gives off a branch to the sub-pelvic. In the neighbourhood of the inguinal circle, it presents two branches, the one external and supe-

is returned from the anterior and posterior portions of the
may be a matter of considerable consequence in certain state
stitution.

Then the question, Whether we should have recourse
vein in order to obtain the benefit of local bleeding? is answered
should be justified in so doing, in cases of abdominal inflammation
should unload the vessels of the walls of the abdomen, and prevent
in unloading some of the internal vessels too, and we should avoid
danger of peritoneal inflammation. For yet stronger reasons
have recourse to it in thoracic affection, for most of the small
tions which compose this vein come from the thorax, and through
sympathy, and there are more numerous anastomoses between
and inner portion of the wall of the chest than of the abdomen.
we were to have recourse to bleeding from this vein, in general
inflammatory affection of the udder, we should betray our
anatomy; and still more so should we do it if we regarded it
as having any further connexion with the secretion of milk, than
a kind of measure or standard of the power and development of
vascular system, with the existence of which the secretion of
as the secretions generally, is essentially connected.

THE HEART.

We return to the neck, and we can trace the veins in their course
to the heart, and the arteries working their way upward from
We therefore naturally enter into the consideration of this
great source of the circulation of the blood. We shall find
that the lungs, on either side, are inclosed in a separate and
each lung has its distinct pleura. The heart lies between these
branes; and, more perfectly to cut off all injurious connexion
lungs and the heart,—all communication of disease—the heart
in a pleura, or bag, of its own, termed the pericardium. This
closely invests the heart; it supports it in its situation,
great dilatation when it is gorged with blood, and too violent
when it is sometimes unduly stimulated. Notwithstanding the
of the pericardium, the heart beats violently enough against the
circumstances of unusual excitation; and were it not thus
would often bruise and injure itself, and cause inflammation in
neighbouring parts.

living, when she became seriously ill, but the symptoms
y connexion with parturition ; indeed they were of that
t it was impossible to say what was the malady. The
illness to move, constipation, and œdematous swell-
he died on the sixth day. On opening her, it appeared
l its investing membrane, or bag, occupied nearly three
space. The delicate and transparent membrane was
ore no slight resemblance to a portion of the paunch ;
ied a gallon of discoloured fluid. A piece of a darning
and a-half in length, with the eye broken off, was found
and a small ulcer, three-quarters of an inch deep, ap-
ex, or point, of the heart. Two sixpenny nails were
h.

of Wentworth, gives a similar account. He was de-
fat heifer. She was dull ; the breathing quickened ;
ck, but intermitting ; the extremities cold ; she refused
as no rumination. It was impossible for the most
to determine what was the nature of the disease ; there
derangement, but nothing more could be affirmed.
he could do ; he bled her, and the bowels being already
red fever medicine. The next day she was no better,
and physicked her. On the following day, some slight
n the chest appeared ; he watched them, he made use
but too much neglected method of detecting disease,—
he ear to the side and belly of the patient, and he as-
there was effusion in the chest. He then knew well
be done, and he ordered her to be destroyed. Not
bag, but the whole of the chest was filled with serum :
ad spread over all the membranes ; but the focus of the
, two inches long, which had pierced through the peri-
ded the heart. The pericardium was thickened, and
rt enlarged. These cases are extracted from 'The
able monthly periodical, devoted to the diseases and
nt of domesticated animals, and from which we shall
nce in the progress of this work.

inclined to believe that these diseases occur oftener than
; and it is an unfortunate circumstance that these
, which in other animals take very strange paths, but
vely harmless ones, in order to work their way out of
re select this dangerous and fatal course. The pro-

tem. It consists of four cavities surrounded by muscular walls, stimulated by the organic nerves, can contract upon, and drive forward, the fluid which they contain, and then, left to themselves, can instantly re-assume their open dilated state by their inherent elasticity.

A portion of the blood has completed the circulation, and is in the upper cavity of the heart—the right auricle—where it accumulates as a reservoir, until there is enough to fill the second and lower cavity of the same side—the right ventricle—when the auricle suddenly contracts, and drives the blood forward into the ventricle. But this blood is in a venous state, and will not support life; then we must change its character, and we throw it back again into the circulation. We must convey it to the lungs, there to be exposed to the influence of the atmospheric air, to be oxygenated, and arterialized. For this purpose the ventricle, stimulated by its energy, contracts, and, as it contracts, it drives a little of the blood back, but it forces more under a dense fringed membrane which has the opening between the auricle and the ventricle, and this membrane, thus raised up all round, closes the opening, and prevents the backflow of the principal part of the blood that way, and it is urged through the aperture into the lungs.

We enter into these particulars that we may have opportunity to describe two or three points of difference in the mechanism of the heart in the horse and the ox. These fringes, which, in the dilated state of the ventricle, hang loose, but which are forced up as the blood insinuates itself behind them when the ventricle contracts, discharge the function of a perfect valve: but they are, as we may suppose, tied to the wall to a certain extent by cords attached to their edges, and which serve to raise certain fleshy or muscular columns that arise within the ventricle. These edges, therefore, are permitted to be elevated, until they have attained a horizontal direction, and meet each other, and perfectly close the opening, and then are stopped by these tendinous cords, which oppose them to the further elevation of the fringes, and that regulated or in a measure controlled by the muscular power of the columns beneath.

DIFFERENCES OF CONSTRUCTION.

We have said that, in the ox, the venous system is more developed than in the horse. The vessels are more numerous and larger, and the blood is pouring on towards the right auricle and ventricle of the heart. The tendinous cords, and the muscular columns beneath, are very coarse and larger and stronger in the ox than in the horse, in order to afford

the daily, unremitting duties of the animal. There is not gainst accident, but, to fit the heart for this incessant hard supplemental muscle in the form of a fleshy band stretching side to the other is given, preventing dilatation, and assisting. The right ventricle of the heart of the ox is worth the purpose of examining this contrivance.

Driven out of the right ventricle into the lungs, and is there action of the atmospheric air, and purified; thence it is left auricle, passes into the left ventricle, and, by the concavity, is propelled through the arteries. The left ventricle is like that of the horse, except that these vessels, being adapted for the distribution of sufficient blood for the general motion, yet are not large enough for the occasional enormous heart of the horse; in fact, being smaller than they are in power is required to force a fluid through a narrow tube, and the walls of the ventricle are thicker in the ox. The size of the arteries is nowhere more apparent than in the lungs of the horse are nearly double the size of those of the ox, are scarcely half as large.

Perhaps, to have a glimpse of the cause of the evident difference of these different classes of blood-vessels in the horse and the work of the one, although hard, is equable. There is little difference in the services of the one to cause much variation in the degree of the other.

The labour of the other is irregular, often to the greatest extent. The vessels must be enabled to accommodate themselves to this. The artery is a highly elastic tube, and will accommodate a smaller quantity of blood usually circulating in the horse, but of greater size, to give free passage to those sudden rushes of blood in the ox is, in a state of health, comparatively exempt.

The aorta, however, or the large vessel which first receives the blood from the heart in order to carry it to the viscera and the hinder extremities, in some measure, reversed, or at least some of the arteries are not known in the horse. This is particularly the case with the celiac artery, which supplies the liver, the spleen, and the stomachs. The hepatic artery to the liver is not much enlarged, but the splenic one is, and ramifications from it go to the rumen; and the gastric artery, to the stomach, is considerably larger than the whole of the hepatic. We need not, however, wonder at this when we consider the size of the rumen, or paunch, and the important offices of the other stomachs.

From the left ventricle, which carry the arterial blood through

disease, although too often a contrary effect is produced.

The heart is subject to inflammation, but not so often as in
It would be principally recognized by the strength of the pulse
the bounding action of the heart, evident enough when the hand is
on the side of the chest, and which may be seen and heard at
distance.

THE ARTERIAL SYSTEM.

The blood is carried on through the arteries by the force of the heart.
These are composed of three coats; the outer, or elastic, by which they
yield to the gush of blood; the muscular coat by which they contract
tracts again when the gush of blood has passed; and the inner, or
glistening coat, which lessens the friction of the blood against
the vessel, and its consequent gradual retardation in its course.

THE PULSE.

The muscular coat of the artery can be felt giving way to the
of blood: and the expansion of the artery, as the blood passes, is
the pulse. Every one who knows the least about cattle is sensible of the
importance of the indications to be obtained by the pulse. The
blood may be felt at the root of the horn; and the rallying of the
around some important, but inflamed part, may be guessed at by
of the coldness of the ear, or the extremities: but here we are to
state of the general system, and the increased force or debility of the
tral machine on which every secretion and every function depend.
has been stated that the pulse is not so easily felt at the jaw in the
temporal artery will generally be sufficiently distinct; but, on the
will be most convenient to ascertain the beating of the heart by
placing the hand on the left side, a little within and behind the
The average pulse of a full-grown healthy ox is about forty.
is here referred to what has been said of *the pulse* in the *Treatise on the Horse*."

THE CAPILLARIES.

The blood continues to circulate along the arteries, until the
ramifications have diminished so much in size, as to be termed
or *hair-like tubes*, although many of them are not one-hundredth
large as a hair. The heart ceases to have influence here. No
behind could drive the blood through vessels so minute. And

er disease. Inflammation is increased action of these
the increased action is confined to a few capillaries, or a
single organ, the inflammation is said to be local; but
the whole of the system, it assumes the name of fever.
is the consequence of increased action of the capilla-
be effected by the practitioner is to reduce that inordinate
thy standard, before the part has become debilitated or
overwork. Bleeding is one of the most effectual mea-
ly local bleeding. The increased action of the vessels,
t redness, heat and swelling of the part, are at once
f inflammatory action, and tend to prolong and to in-
ous bleeding, therefore, by relieving the overloaded ves-
them, once more, to contract on their contents, is un-
ated. To this physic will follow, and there is scarcely
disease in the ox in which it can, by possibility, be inju-
nd cooling diet will be essential.

applications, they will be best treated when the different
nation pass in review before us; but, as a general rule,
er will occasionally be puzzled as to the propriety of hot
) in cases of superficial inflammation, and in the early
ase, cold lotions will be most useful; in cases of deeper-
d of considerable standing, warm fomentations will be
first will best succeed in abstracting the inflammatory
ill relax the fibres of the neighbouring parts, which press
uate, the injury, and will also restore the suspended per-
s, however, will continually occur in which the most
t will be required in different stages of inflammation.

FEVER.

ibed fever as general capillary action, and with or without
; or it is the consequence of the sympathy of the system
n of some particular part. The first is called *pure* or
the other *symptomatic* fever.

ur from being unfrequent in cattle. A beast, yesterday in
bserved to-day—dull, the muzzle dry, rumination and
quite ceased, or being carelessly or lazily performed, the
ttle, the root of the horn is unnaturally hot, the pulse is
somewhat hard. The owner or the practitioner removes
l, and carefully examines him; the animal is evidently not
t discover any local affection or disease; he, however, does

inflammation. It is pure or idiopathic fever, assuming, after local determination. This is a serious, and frequently a fatal case, the whole system having been previously affected, and, probably, debilitated. When disposed to take on inflammatory action, the proper remedies should be so fearlessly and successfully used. Local means of abating the inflammation must here be pushed to their full extent.

Symptomatic fever is yet more frequent and dangerous. No consequence can be long disordered or inflamed without the neighbouring parts being disturbed, and the whole system gradually sharing in the disturbance. By the degree of this general affection, by the state of the mouth, and the frequency of the pulse, a judgment is formed of the degree of general disturbance, but of the intensity of the inflammation. The subsidence of the pulse, and the return of the appetite, the recommencement of rumination, are hailed as indications of the diminution of the general irritation, and the local cause of it.

Some have denied the existence of this essential fever in cattle; but the facts that have been stated cannot be doubted. When the cattle are unwell, they are feverish; a dose of physic is given, they are perfectly well for a day or two, and they are well. At other times they are feverish, and that fever all at once terminates in hoove or pneumonia. In one case, there is fever never becoming associated with local affection; in the other, it speedily terminates in local affection; but, in the former, it is, for awhile, pure fever. It would be scarcely necessary to remark, were there not so many instances of bad and dangerous practice, the early treatment of these cases. If fever were plainly recognised, the owner or the surgeon would be more anxious to get rid of the local affection before the system was materially affected; and if he suspected pure and essential fever, he would endeavour to knock it down before it took on local determination. These are the golden rules of practice, which no nonsensical theories should cause any one for a moment to forget.

INFLAMMATORY FEVER.

Cattle are not merely subject to fever of common intensity, pure or symptomatic, but thousands of them fall victims every year to a disease which, from its virulent character and speedy course, is termed inflammatory fever. A disease of this character, but known by a number of strange yet not inexpressive terms, is occasionally met with, and exceedingly fatal among cattle in every district. It is termed

which acts upon this inflammatory predisposition, and the
ough the district

w premonitory symptoms of inflammatory fever. Often
nd generally with very slight indications of previous ill-
al is found with his neck extended ; his head brought, as
effect it, into a horizontal position ; the eyes protruding,
uzzle dry ; the nostrils expanded ; the breath hot ; the root
nsiderably so ; the mouth partly open ; the tongue en-
arently so ; the pulse full, hard, and from 65 to 70 ; the
ened and laborious ; the flanks violently heaving, and the
; in a low and peculiar way.

he animal is in full possession of his senses, but generally
ree of unconsciousness of surrounding objects : he will
our or more without the slightest change of posture ; he
induced to move, or when compelled to do so, he staggers ;
ring is principally referrible to the hind-quarters ; rumi-
ed, and the appetite is quite gone. After awhile he becomes
et it is oftener a change of posture to ease his tired limbs,
at length he lies down, or rather drops ; gets up almost
soon down again ; and, debility rapidly increasing, he con-
; sometimes he lies in a comatose state ; at others, there are
fruitless efforts to rise. The symptoms rapidly increase ;
ermission ; and the animal dies in twelve or twenty-four

rity of cases, and especially if the disease has been pro-
he animal seems to rally a little, and some of the symp-
om which the common names of the disease derive their
east attempts to get up : after some attempts he suc-
sadly lame in one or both of the hindquarters. If he is
e suddenly becomes lame ; so lame as to be scarcely able
as *quarter evil*—*joint murrain*.

always an unfavourable symptom. The disease may be
l parts for those of less consequence. If the apparent
th continues for a day or two, we may encourage some
ust not be sanguine ; for it is too often only a temporary
pite.

mpptoms now most to be dreaded is the rapid progress of
already begun to appear—tenderness on the loins and
nt will not bear even the slightest pressure on these parts.
rse if to these are added swellings about the shoulders

of blood over it, and both are exceedingly fatal.
In this state the animal may continue two or three days, with a mass of putridity; unless there has been an honest, active man who never shrinks from his duty—who has some courage and a good stomach,—and who will properly dress the ulcers and administer medicines. Many a beast has been saved even at this point of disease; and the farmer or the veterinary surgeon should prize his servant. The first favourable symptom will be a slight diminution of the foetor—the ulcers will then speedily heal, and the strength will return.

The chief appearance after death will be venous congestion of the organs. The larger and the smaller trunks will be black, and distended with blood, and bursting. It is a striking illustration of the peculiar vascular system of the animal; and, as will be presently seen, speaks volumes as to the propriety of treating this and similar diseases.

The congestion is everywhere. It affects both of the pleurae, the intercostal and the pulmonary; and the whole substance of the lungs. It extends over the peritoneum, and more particularly over the serous membrane of the intestines; and patches of inflammation and abscesses are found in every part of the colon. These are the appearances which the animal is carried off during the inflammatory stage of the disease.

If the complaint has assumed a putrid type, there is effusion of blood, of which can scarcely be borne, both in the chest and belly; with inflammation and agglutination of all the small intestines. Often vomicae in the lungs, and effusion in the pericardium. Every stomach is inflamed, and the fourth ulcerated through. The substance of the liver is broken up. There are ulcerations generally of the smaller, and always of the larger, intestines; and in every part of the cellular membrane there are patches of inflammation running fast into gangrene.

There cannot be a doubt respecting either the nature or the progress of such a disease. It is, at first, of a purely inflammatory character. The inflammation is so intense, as speedily to destroy the powers of the system. The capillary vessels must have been working with strange violence in order to fill and to clog every venous canal. The congestion is in the cranium as well as in other parts, and the distended vessels press on the substance of the brain, and that pressure is propagated to the commencement of the nerves; and hence debility, and staggering, and perfect insensibility. As the congestion early takes place, the stupor is early in its appearance.

The nervous energy being thus impeded, the power of locomotion is first to fail; then general debility succeeds, and at length other

the eagerness of the farmer, have exposed the consti-
tution to the excess of otherwise healthy stimulus; and when the ani-
mal is in a manner, prepared for fever. Some have attributed the
disease to the due quantity of crowfoot, or other acid plants. They are

It is the excess of healthy stimulus. If the early
part of the spring has been cold and ungenial, and then
warmer has suddenly set in, nothing is so common as for
the disease to appear: but the change in the temperature, or other
in the atmosphere, has had only an indirect effect in producing
the sudden increase of nutriment which has done the mischief.
If the cattle are moved from a poor to a more luxuriant pasture, if the
food is sufficiently high, they distend the paunch almost to bursting,
with the result; but if the change is more in the quality than in
the food, the evil is more slowly produced, and it is more
difficult to inflammation is excited, which wants but a slight
spark to be kindled into a flame. It is the penalty which the breeder must
pay, which he must carefully, and not always successfully,
avoid, when he is endeavouring to obtain all the advantage
from the richness of his pasture, and the aptitude to fatten, and
to breed his cattle.

A farmer who speculated—and with very considerable advantage—
in the purchase of a considerable tract of land, newly recovered from the
flood, between Wareham towards Poole, bought a dairy of
cows. They arrived in the very early part of the spring; they
were fed on Swedish turnips, and, as soon as it was practi-
cable, they were turned on this maiden and luxuriant pasture. In the
space of three months twelve of them died. This was rather
strange, as such cows are, generally speaking, exempt from inflamma-
tion. Perhaps this circumstance prevented both the owner
from tracing the fearful mortality to its true cause.
A surgeon was sent for from London to inquire into the
cause of the disease. There was not a sick animal on
the farm, and the only circumstance which could excite attention
in the cattle looked in much better condition than Suffolk cows
ought to do. The bailiff was a little jealous of the inter-
ference of the veterinarian, and threw no more light upon the subject than
he could, and the veterinarian was, in his turn, cautious and
expressed a wish to see a little of this fine estate. The
request scarcely be refused, and, indeed, was gratifying; and, soon
afterwards, somewhat upland, but still very good pasture, he stoped,

to disease in the ox, for we keep him, as nearly as we can, in a rational hope of safety, in a state of plethora.

The very name of the disease, *inflammatory fever*, indicates the nature of treatment. In a case of excessive vascular action, the first and most important step is copious depletion. As much blood must be taken from the animal will bear to lose; and the stream must flow on until it staggers or threatens to fall. Here, more than in any other case, there must be no foolish directions about quantities. As much blood *must be taken away as can be got*; for it is only by the bold and judicious use of depletory measures that a malady can be subdued and its course so rapidly.

Purging must immediately follow. The Epsom salts are here, in inflammatory diseases, the best purgative. A pound and a half in water or gruel, and poured down the throat as gently as possible, should be our first dose; and no aromatic should accompany it. If it does not operate in the course of six hours, another pound should be given; after that, half-pound doses every six hours until the effect is produced.

At the expiration of the first six hours the patient should be examined. Is there any amendment? Is the pulse slower? If not, he must be bled a second time, and until the circulation is more affected. If the animal is somewhat better, yet not to the extent could be wished, the practitioner would be warranted in bleeding again, provided the sinking and fluttering of the pulse does not indicate commencement of debility.

If the pulse is a little quieted, and purging has taken place, and the animal is somewhat more himself, the treatment should be followed by diligent exhibition of sedative medicines. A drachm and a half of opium and one drachm of emetic tartar, and half an ounce of nitre, may be given three times every day; and setons inserted in the dewlap. The decoction of black hellebore-root are the best, as producing the quickest and most extensive inflammation. No trouble need to be taken about feeding the beast now, although he may be in the pasture which was the cause of all the mischief, for he will not eat until he is very much better; and then he cannot be too quickly moved.

If the animal is not seen until the inflammatory stage has nearly passed, the skill of the practitioner will be put to the test; yet he will not find much difficulty in deciding how he ought to proceed. Has the animal been bled at all? if it has not, nothing can excuse the want of bleeding now, except debility too palpable to be mistaken.

should get into it, —and also to stimulate the fourth store of the frame, if fortunately it should reach so far as this end of the Epsom salts at first, and half-pound doses the bowels are opened, will be sufficient in this stage; fourth dose, (injections having been given in the mean not produced, the quantity of the aromatic, but not of y be increased. It is probable that the medicine has the rumen, where it will remain inert until that cuticular insensible stomach is roused to action by the stimulus No other medicine should be given until the bowels have in many cases very little other medicine will afterwards

ving been opened, recourse should be had once more it indicates any degree of fever, as it sometimes arent debility is not always the consequence of ex-vascular congestion,) the physic must be continued, but ould perhaps be too weak for the direct sedative medi-her hand, however, no tonic medicine must be given: be kindled afresh after it has been partially subdued. pulse is weak, wavering, irregular, giving sufficient he fever has passed, and debility succeeded, recourse nic medicines. The tonics, however, which in such cases al in cattle are very few. The exhibition of the mineral been attended by any satisfactory result—the barks have red to agree, but in gentian, calombo, and ginger, the e diseases of cattle will find almost every thing that he two first are excellent stomachics, as well as tonics; the mply because it is the very best stomachic in the cattle They may be given three times every day in doses of a the two first, and half a drachm of the last. They will al in these moderate doses than in the overwhelming ch some administer them, and in which they oppress and ther than stimulate and give appetite. They should n gruel, with half a pint, or even a pint of sound ale. er may possibly be called in after ulcers have broken ghing process has commenced: there must be no bleeding of the system has received a sufficient shock, and vari- re actually decomposing; but physic is necessary, with a e aromatic, in order to rouse the energies of the diges- to get rid of much offensive and dangerous matter col- estinal canal. Epsom salts will here also constitute the

probability of the liquor flowing on into the fourth stomach.

Tonics should on no account be neglected, but they should be administered with any nonsensical views of their antiseptic nature, changing the properties of the animal fluids, but simply as to arouse to action the languid, or almost lifeless powers of the frame.

If the stench from the ulcers does not abate, the solution of iron should be quickly increased to a double strength; but as soon as it has ceased, and the wounds begin to have a healthy appearance, the ointment or the tincture of aloes may be adopted, and the labour will be less. When the animal begins to eat he should be turned into a field at hand, the grass of which has been cropped pretty closely. The manure should be retained for three or four weeks; but as for the medicine, it cannot be too soon discontinued when the animal is once set on his legs. When art has subdued the disease, nature, although slowly, will successfully resume her wonted functions.

The breeder has much in his power in the way of preventing disease. Cattle should be carefully examined every day. Any little heat on the flanks, or inflammation of the eyes, or heat-bumps on the back, or swelling, will be regarded with suspicion, and met by a gentle purgative, or the abstraction of a little blood; but the decided appearance of a malarial fever in one of them will not be misunderstood for a moment. It will convince him that he has been making more haste than good. In the disease of one, he will see the danger of all. All who are subject to the same predisposing causes of disease, should be kept in a healthy state, and turned into a field of short and inferior keep.

John Lawrence, whose work on cattle has often been mentioned in this respect, expresses himself in his own somewhat peculiar way on this point. 'Prevention of this disease is the only cure worth notice, because, after the attack, the veterinary case renders all remedy either uncertain, or of very little probability of success, on account of the expense of time and money. A short or inferior keep should be reserved as a *digesting place*, where cattle may be occasionally turned to empty and exercise. Those observed to advance very fast may be bled monthly for several months, of the efficacy of which practice I have, however, but a so good an opinion as of that of giving medicines which prevent obstruction. I am well aware of the difficulty of such measures on a large number of cattle in the field, but I am convinced that occasional use of purgative or alterative medicines, would prevent those diseases which arise from their rise in over-repletion and accumulation.'

er, yet some of them occasionally preceding it. Riding of Yorkshire, the first symptoms are those of cattle are seized first in one quarter, and then in the other. and the crackling noise is heard almost from the beginning, and the crackling noise is heard almost from the beginning. This is usually fatal when it assumes this form. Riding, where from the rapidity with which it runs its and the *speed*, it also generally begins behind. Inflammation, seizes one hock. It runs up the quarter, actually putrid in the course of an hour or two, while the true sound. Few, and especially young beasts, survive the kind. Here the active use of local applications is indicated, they will rarely be of much service.

of Surry, under the name of the *puck*, the fore-quarter, or part mostly affected; and the animal frequently dies in. On skinning the beast, the whole quarter appears black with effusion of blood, and is softened and decomposed as though by a general bruise.

of Reigate, puts this in a very clear point of view. He (quarter-evil) is indicative only of a variety of it; or, the diseases that connects itself with it: and this disease is completely limited to the quarter attacked as a fit of hemiplegia of the human being. The animal is generally in the state of fever; but the quarter-evil is limited to the quarter, as it is popularly expressed, precisely like a jelly. There are many preventives, in which great confidence is placed, which agree only in being composed of the most powerful. as a singular notion about it, yet containing in it some that it is caused by cattle feeding on the buds of trees or and hedge-rows, together with an over-indulgence in lying down, whereby they acquire a sluggish habit, and are torpid. His preventive is very consistent with this rather a singular one. He says that they should be turned out on acres of coarse sharp-bladed grass, and there should be some colts of a year or two years' growth, which, by their bolts, will harass the calves thoroughly; and by keeping them in health.

Readers, we trust, will have recourse to that preventive, which is described in his usual happy manner (p. 586). which introduced the following most extraordinary operation

grass from the sun until it had attained an enormous growth. It is added that when agriculture improved, these shrubs were cut down, the herbage became milder and more wholesome, and the disease rarely appeared. It may, with greater probability, be attributed to the improvement in the general management of cattle, and the increased knowledge of their constitution and diseases. Indeed, some more accurate knowledge was required of the nature and treatment of the diseases of cattle. The following absurd and cruel superstition was had recourse to, not merely by the peasants but by those who ought to have known better. The beast attacked by black quarter was taken into a byre, or stall, into which cattle were never after to enter; the heart was taken out of the animal while it was alive, and carried into the byre where the farm cattle were kept, and hung up there; and while it remained there none of the cattle would be attacked by this malady.

They have more harmless superstitions in other countries. In France a veterinary surgeon was called on to treat this disease in some farm. The owner was the more grieved at its breaking out in his farm since he had lately purchased, at considerable expense, an amulet that was supposed to insure the safety of his cattle for ever. The surgeon inquired about the amulet and was told that it had been buried with great ceremony at the cow-house, with the assurance that every animal that passed by it was charmed against the complaint. M. Desplas expressed his indignation to dig up this amulet, and see what it was made of. He was entreated not to do so, for certain and sudden death would be the result of this profane attempt. He obtained the proper instruments, and procured and interred the awful talisman. It was in the form of a packet; and when unfolded, presented a farthing, a little leavened bread, and a small piece wrapped in a small piece of black stuff pilfered from the stole of the church. M. Desplas placed these sacred things in his museum, and the animal was cured. The enchanter had received a quantity of money worth five francs, and several couples of pullets. It is a good example descriptive of the lower class of French agriculturists, it is not unlike those of England) that, after all, he who had taken the money, and not cured the animal, inspired more confidence than the veterinary surgeon who, sent by Government, had cured the beast gratuitously.

TYPHUS FEVER.

One other species of fever is yet to be described, that has not been admitted into the sadly incomplete veterinary nosology, but with

becomes established, diarrhœa succeeds; and this is either all doses of medicine from which no danger could be suspected on spontaneously. It is not, however, violent, but it lasts for days. It bids defiance to the skill of the most experienced, or, if it is arrested for a little while, it is sure to return. It is peculiarly fœtid; occasionally mixed with blood, and containing a considerable quantity of mucus.

Several weeks have probably now elapsed, and then succeed the signs of *low fever* in cattle. Tumours form round the joints of the back or udder; these ulcerate, spread, and become fœtid. The sweet breath of the ox is gone,—it is as offensive as the fact, we have that which can scarcely be distinguished from the stage of inflammatory fever.

It is prevalent in the spring and fall of the year, and when the weather is genial and the latter wet. The pasture generally possesses a degree of luxuriance, although its herbage may be coarse; but is usually in good condition when first attacked by the disease.

It has sometimes been epidemic and fatal to a dreadful extent, assuming the form of, or being connected with, epidemic typhoid fever, or times accompanied by dysentery; but frequently being, for some weeks, typhoid fever without any local determination.

It is typhoid fever both in the ruminant and the human being, and of much obscurity. Some have accounted for it from the exhalation of certain gases or miasmata from vegetable substances under the influence of decomposition. Certainly it is most prevalent, on marshy ground; and during cold, wet, variable weather. A long wet season is to be followed by typhus fever in every low, marshy tract. In the higher pastures, where the cattle seem exposed to greater dryness, less wet, little of it is seen.

It can be doubted whether it is infectious; but all the cattle have been exposed to the same predisposing causes of disease. The farmer should remove the infected beasts from the sound ones as soon as possible, and the carcass of the animal that dies of inflammatory or typhoid fever should be buried without delay.

There are many cases which puzzle the farmer and the practitioner too; and, although the best way, they too frequently will not yield to medical treatment. One rule, however, which cannot mislead. *If there is fire,*

Physic will naturally follow, but with some caution, to
been already stated that there is a natural tendency to diarrhoea
with this disease, and which is often troublesome to subdue.
Epsom salts should be given with the usual quantity of aromatics,
but the action of this purgative should be secured and kept up by
pound doses of sulphur, administered as circumstances may require.

To this will follow the usual sedative medicine—digitalis,
and nitre. The practitioner must not be deluded here. When the
and horns are hot, and the pulse rapid, tonics would be poisonous
them not at all. *He has to put out the fire, and not to feed it.* When
the fever is subdued, but nature finds some difficulty in rallying,
give our gentian, calumbo, and ginger, with advantage. The
circumstances in which the cow-leech has done so much harm to
so many victims, as when a fire has been smouldering and consuming the
energies of life, and he has fed it, and caused it to burst out with
force, by means of his abominable cordials.*

When the tumours and ulcerations appear, the second stage of
matory fever is established, and the measures recommended for the
malady passed under consideration must be adopted. This disease is
cattle of all ages. Full-grown beasts are more subject to typhoid
inflammatory fever; but among the younger ones and the weaners,
and those of eight, nine, and ten months' old, it is extremely common,
they have not strength to bear up against this secretly-consuming
fever.

The mode of prevention, when it first breaks out among
similar to that of inflammatory fever,—namely, to bleed freely.
The grand thing of all, however, is to remove not merely to
to dryer pasture. With the youngsters, bleeding may, perhaps,

* We transcribe the ingredients of a *felon* drink, a name for cold, rheumatism,
and various unclassified diseases. It is recommended by Mr. Knowlson,
fifty-seven years in full practice. He first describes the disease. The
stiff, and not good to get hold of: it loses its flesh; walks stiff in its limbs,
dim and watery; and it neither eats nor drinks so freely as it should do.
strong beast, 2 ounces of beast spice, 1 do. turmeric, 1 do. powder of aniseed
seed in powder, 2 do. ginger in powder, 2 do. grains of Paradise in powder,
1 do. sweet fennel, 1 do. Mithridate. All these are to be mixed together
ale with a little treacle, and to be given fasting.

The next he calls the *common* felon drink: it is the usual cordial drink of
and administered for almost every disease. Take 2 ounces of beast spice
1 do. aniseed, 1 do. long pepper, 1 do. diapente, 1 do. Fœnugreek, 1 do.
Mithridate, 1 do. grains of Paradise, 1 do. Galengal, 1 do. carraway seed
wonder at the almost uniformly fatal termination of inflammatory diseases.

blood is essentially changed as it traverses them. It is then more fluid, and no longer capable of sustaining life; and it must be again rendered arterial. The capillaries which have undergone this change begin to unite, and, when a number of them have joined their streams, that branch is called a vein. The branches of the vein are much weaker and thinner than those of the artery. The blood flows through them by a different principle from that which governs the circulation either in the arteries or capillaries.

In the limbs, or that are subject to the pressure of any of the valves, which permit the blood to flow on towards the heart, an insuperable obstacle to its course in a contrary direction. The pressure of the muscles, a considerable power is, occasionally called into exercise to propel the blood along the veins. The lungs, however, are not under the influence of these muscles. The chest and belly are out of the reach of muscular pressure, and are not of this valvular apparatus, but they are acted upon by a different principle.

The heart has been described as an elastic muscle. It has scarcely any stimulus of the organic nerves when it expands again by its elasticity, and that important principle, by the influence of which it follows the sucker in the common pump, and rushes in when the piston is raised in the fire-engine,—that principle of the atmosphere,—acts here, too, and the cavities of the heart expand again as soon as they expand; and this living pump would be forced in while there was fluid in circulation. It would be forced in from the most distant veins, in the same manner as water flows along the pipes from the most distant reservoir in the inferior machines—the works of men's hands. Thus the circulation is maintained by the action of the heart, while the blood is in the arteries; by the muscular power of the capillaries, in those little vessels; and by the pressure of the muscles and the valvular apparatus of the veins in some part of its course through the system. Atmospheric pressure, and the principle of the pump, through

VARICOSE VEINS.

It is apt to appear under the form of bog and blood spavin, and occasionally of the jugular and thigh veins, is free from varicose swellings. Now, they seldom appear, except in the veins of the udder, and the neighbourhood of joints that have suffered even more than usual from the action of these parts to which cattle are so liable. An old cow

vessels were secured by a ligature, and the cellular substance was
and which, emptied of its blood, shrunk into an unexpected
compass.

The varicose enlargement was never removed from the first
occasionally it became hot and tender, and interfered with the
The wound presently healed in the second cow, and there was
the matter.

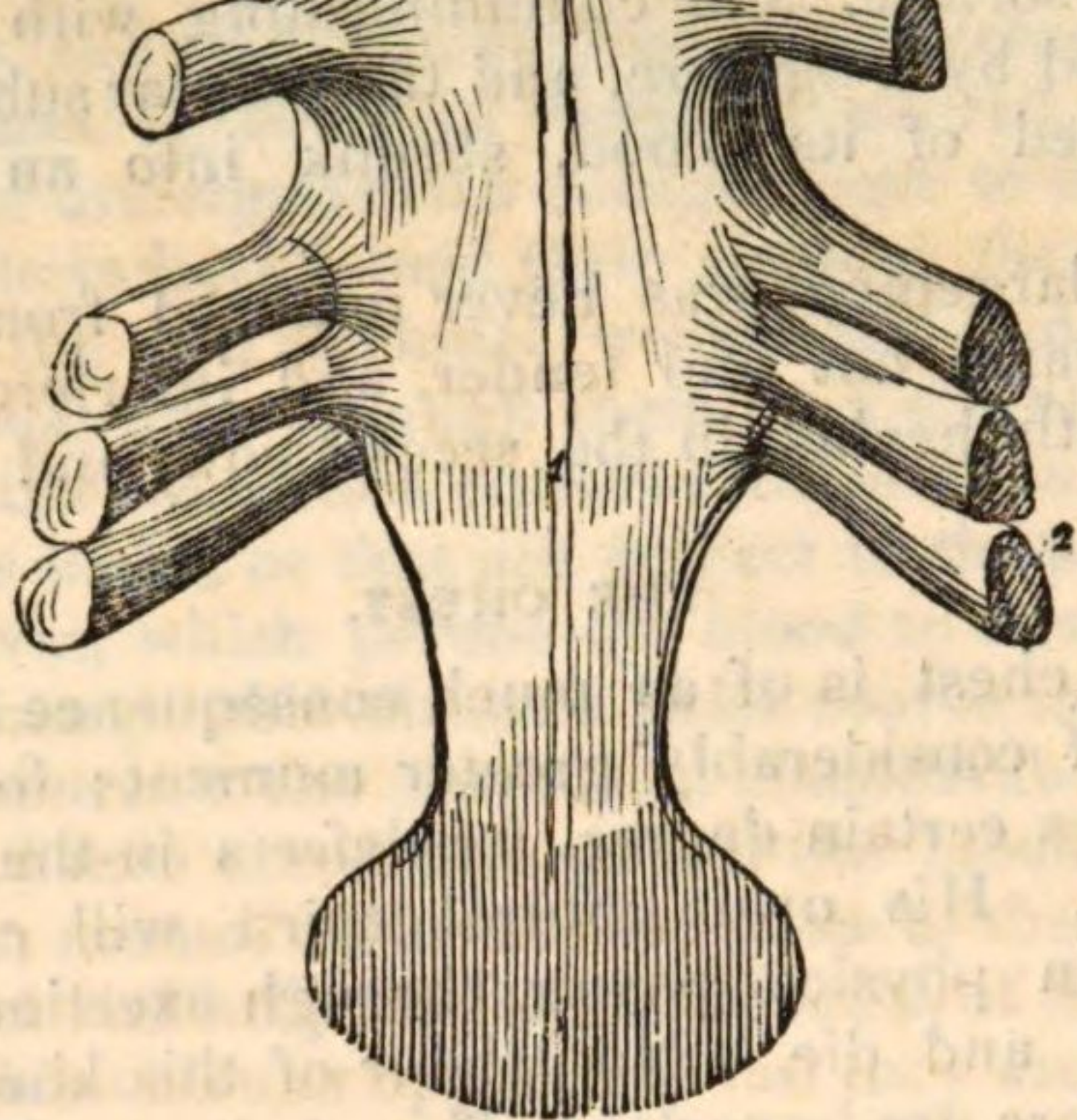
THE CHEST.

The form of the chest is of as much consequence in the ox
horse; nay, it is of considerably greater moment; for plenty
will compensate, to a certain degree, for defects in the form, and
nution of strength. His own natural spirit will carry man
evident deficiently in physical power, through exertions under
coward would sink and die. No labour of this kind is req
the ox; but still there are important offices to be performed by
of the chest which demand constant energetic action, over
mind has no control, and where all depends on the form and ex
thoracic cavity. The blood must be purified, and it must be
through the frame, and that with a rapidity and perfection which
know a moment's intermission.

The chest consists of 13 ribs on either side, or 26 in the whole,
10 less than are found in the horse. Of these 8 on each side
the horse, directly connected with the *sternum*, or breast bone,
termed *true ribs*; the other 5 are attached to cartilages, which
together, and also connected with the sternum in an indirect
these are termed *false ribs*.

The true ribs are considerably longer, larger, thicker, and farther
from each other than in the horse; for, in consequence of
number of short, or false ribs, they take a more backward direction,
cover a portion of the abdomen above, while the sternum
below

They are so formed in the ox as to render the cavity of the chest
far more circular shape than it could be in the horse. This is
referred, in the first place, to the *sternum*, or breast bone. It is
as shown in page 163 of the Treatise on that animal, the breast is
narrow and deep; it bears no indistinct resemblance to the hull of a
ship. It is plainly contrived for the purposes of strength; its
curved form and its depth to the weight which it is destined to
and the momentum, or force, with which that weight will be
thrown on it in rapid motion.



[*The Breast Bone of the Ox.*]

of the sternum, (so called from its resemblance in the form of a ship) or breast bone.

plates by which the ribs are attached to the sternum. cut off.

oid cartilage (resembling a sword, which it does in the anterior part of the sternum, supporting the rumen.

joints, with their capsular ligaments, uniting the cartilages m.

uniting the cartilages with the ribs.

et, receiving the moveable bone at the point of the sternum.

As the above cut will show, the sternum is thin and flat. It presents a surface of considerable width for the floor of the chest, and, gives a circular form for the chest, which the horse could never be a defect in him if he had it, for it would throw too much weight and would render him dangerous both to ride and drive.

the breast is an essential requisite in the ox. The Lin- as one foot and ten inches between the fore legs. It is this alone which will give sufficient surface for the attachment of the character of those of the ox, and will secure sufficient lungs to purify, and the heart to circulate blood enough for the charge of every function. The following cut of the breast of Althorp's bull, will afford a practical illustration of these



[*Lord Althorp's Bull.*]

Now comes another illustration of the admirable manner in which animals are adapted for the purposes which we require of them, the economy of nature in giving to each that which he needs. The horse cannot have this permanently circular chest; for, would ensure to him a plentiful supply of arterial blood, it would be a heaviness before, and a general accumulation of muscle and fat would interfere with his general usefulness: yet that the chest possess the power of expansion to a certain degree, every rib is connected to the sternum by a perfect joint; and thus the hurried breathing, usually quickened action is materially assisted. The chest expands and contracted much more rapidly, and to a greater extent, with less expenditure of muscular power, than could be effected with fixed joints.

The flatness of the breast bone at the base of the chest of the ox is a *permanent* sufficiency of capacity; and a *perfect* joint between the sternum and the sternum is not only not wanted, but might interfere with the equable action of the respiratory apparatus in this animal. However, between the rib and the sternum does admit of a certain degree of motion, and would, to a great extent, contribute to the expansion of the chest, if rapid action, or accident, or disease should require it.

The sternum of the ox has a process projecting very far anteriorly, but not closing the entrance into the chest so much as in that which is found in the horse. That process, or first costal cartilage of the sternum, has a joint which is not found in the horse. It admits of a degree of lateral action only. — It materially assists the walking action of the animal, and which appears to be absolutely necessary. We consider the vast accumulation of flesh and fat about the chest, especially that singular collection of them, the brisket, scarcely of which is observed in the horse.

The muscles which are most concerned in giving bulk to the chest are the *transverse pectorals*. They form the grand prominences

n front of it, and dipping downwards nearly or quite as
proof of depth of chest. It is found of a great size
oved cattle, varying in size in different breeds, and in
f the same breed; and it was always looked for and
ter specimens of the old cattle. It is, at least, a proof of
ss. A beast that will accumulate so much flesh and fat
will not be deficient in other points.

shire ox, the brisket was only 14 inches from the ground.
en of Scots carried her brisket only $15\frac{1}{2}$ inches from the

able that this may be carried too far. An enormously pro-
ay evince a more than usual tendency to fatten; but not
endency to accumulate that fat irregularly—to have it
tches, and not spread equally over the frame. Many
must present themselves to the recollection of the grazier,
some of the short-horn breeds. In a very few instances
st fancied that this enormously projecting brisket was a
n an excellence; at least, that it somewhat impaired the
f the animal, if it did not diminish his sterling excellence.
ould be prominent as well as deep; perhaps on one
ominent than deep, for it will then be more likely, either
time it arrives at the posterior border of the elbow or
e subsided to the thickness of the fatty and other substance
g the sternum. One defect, but not of half the con-
t is generally supposed to be, would then be avoided—
inution of the chest at the girthing place, or immediately
s. Some have evidently considered this to be an actual
floor of the chest, and a consequent lessening of its
oint; and, on that account, a most serious defect. There
hich the patrons of the short-horns have laboured more
enerally more unsuccessfully, to remedy. It is certainly
it evinces a disposition to accumulate fat in a somewhat
but it is not so bad as has been represented or feared.
evation of the sternum,—no diminution of the capacity
is a rather too sudden termination of the protuberance
either from the accumulation of the principal part of
forward, or from a want of disposition in the beast to
ble way. If the brisket were removed, the bicast-bond
o be gradually rounding, and rising from this spot, and
er between the elbows. It will be interesting to compare

THE RIBS.

The first rib on either side is a short, rather straight, and strong bone. It has much of the head and neck to support the fulcrum or fixed point on which all the other bones are placed. Each rib is united to the spine by a strength of attachment almost rival that of the horse.

They spring from the spine in a more horizontal direction than in the horse; and, consequently, there is a provision for the capacity of the chest above as well as below. The ribs of the horse take from the spine an evident slanting direction. The bones, being more numerous, afford elasticity and ease of motion by their multiplied joints; the ribs of the back, and loins, are narrower, for the convenience of the rider. In the ox the bones are fewer, in order that they may be larger for the attachment of additional muscle; they spring out at once laterally, in a direction as would render them exceedingly awkward for the rider, in order to secure that permanent capacity of chest which the horse and the ox require.

Therefore it is that in some breeds a little flat-sidedness (which is better) may be forgiven, because the width of the sternum between the spine, in some degree, but more particularly the *springing* of the ribs above, secure a sufficient and an unsuspected capacity of chest. On this account that the Devon ox is active and profitable workman, and afterwards grazes kindly. The conformation of the bones which have been just described give him a considerable capacity of chest, notwithstanding his somewhat too flat sides. yet in the animal which is valued for his grazing properties, something more would be found, and would be found.

The shoulder being past, this horizontal projection of the chest is more evident; and, in order that the barrel-form shall be as good as it can be made, each rib is twisted. Its posterior edge is turned upwards and outwards; and as, proceeding backwards, each rib is beyond the preceding one, not only until the eight true ribs, but also the five false ones; the carcase of a well-made, profitable ox increases in width and in capacity, until we arrive at, or near the loins. For illustration of this reference may be made to any cross-sections of the Kyloe, Galloway, or New Leicester, or Short-horn.

In point of fact, however, the thorax is now passed, and

er, some provision seems to be made for this, by their being
ed than in the horse.

processes of the anterior bones of the back, constituting
stronger, but not so long as they are in the horse. While
rve should mark the situation of the withers, the irregu-
cesses of the bones should never be visible. The less the
, and no decided hollow behind should point out the place
ers terminate, and the more level surface of the back com-
is a departure from good conformation, for which nothing
e. It not only takes away so much substance from the
ood flesh and fat should be thickly laid on, but it generally
position to accumulate flesh and fat in the right places.
n of these parts, however, will be better understood when
fore limbs of the ox; and the spine generally more pro-
to the cavity of the belly, of which it is the roof. We,
more go back to the upper part of the neck.

THE LARYNX.

ior part of the pharynx, and the top of the windpipe, we find
structed cartilaginous box called *the larynx*. It is the guard
est particles of food, or any injurious substance should
the air-passages, and it is at the same time the instrument
cut 1, p. 325.) Every portion of food, whether swallowed
he purpose of re-mastication, passes over it; and it would be
e to avoid frequent inconvenience, and danger of suffoca-
t for a lid or covering to the entrance of this box, termed
(fig. 5), which yields to the pressure of the food passing
flat on the entrance into the windpipe, and, being of a car-
ture, rises again by its inherent elasticity as soon as the
forced along, and permits the animal to breathe again.
the larynx is composed of separate cartilages, to which
attached that regulate the size of the opening into the
e voice, or alteration in breathing from exertion or disease,
Fig. 11 gives a view of the *rimæ glottidis*, or edge
r opening into the windpipe. It appears a little more pro-
the horse, but the opening into the windpipe is consider-
n in that animal, because little speed is required in the
x, and there is rarely any hurried or distressed breathing.
the opening into the windpipe is smaller, there is more
ances getting into it, for all the food passes thrice over it;

In order to prevent this, we have the broad epiglottis, either side, and at the angle of the opening; the cartilage composed is thinner; its rounded extremity is curled,—so as to yield *and be pressed down*, and give an uninterfering and securely cover the opening when the food is returned, and its thinness, it yields in another way, and *uncurls* and covers when the food is swallowed*.

The arytænoid cartilages (fig. 6) are smaller in the ox than the thyroïd cartilages (fig. 7) are larger. The interior of the ox—the organ of voice—is more simple than in any other animal. There is neither membrane across the opening, nor duplicatures of membrane resembling sacs within the larynx. The voice is the least capable of modulation of any of our quadrupeds.

THE WINDPIPE,

The *trachea*, or windpipe, of the cattle is considerably different from the horse, because so much air is not wanted. The ox is slow of speed, and he rarely goes beyond the walk or trot. The rings are narrower (fig. 9, cut 2, p. 325), and although of less firm consistence. The interposed ligamentous substance (fig. 10, cut 1, p. 325). It is also wider in the fresh state from its thinness and weakness, it quickly contracts as represented in this cut. A tube of looser construction than the portion of air which the ox needs in respiration; usually the whole of his food from the ground, and gathering it and being longer occupied about it, more freedom of motion and degree of extension is requisite.

* Some persons have said, and indeed the author is very much inclined to believe, and his old recollections and present experience confirm that belief, that the tongues which in large towns are pickled by the drysalter, and find their way to the taverns, or of private individuals, never came from the mouth of the ox. The epiglottis, however, will tell tales. It is generally preserved in the pickle, and not, that will be regarded as a very suspicious circumstance. The observation, whether this cartilage is rounded and curled, or sharp, will decide the question as to whom it once belonged. One inspection of fig. 5 in the cuts of the larynx will prevent all doubt on a subject of some importance to the lovers of the horse. It may be added that the tongue of the horse is tied down by the spur and is short and thick. (See fig. 1 in the cut of the larynx of the horse.) In the ox the spur is a mere tubercle (see cut 2, fig. 1, p. 325), and from this curb is used to clean the whole of the muzzle, and can be introduced into the nostril. A short plump tongue, then, until the epiglottis is seen, is not a long, ugly looking tongue, with a rounded epiglottis, may be eaten.

neighbourhood of the lungs is smaller, and the additional cartilage given to the horse for the same purpose are altogether different. The rings of the windpipe of the ox are about 60, or 80, and are usually found in the horse.

TRACHEOTOMY.

There are fewer diseases of cattle in which the animal is suffocated than there are in the horse, yet occasionally inflammation of the parotid gland, and in those varieties of the ox are so much characterized by the formation of a swelling on the windpipe, much contracting its lumen, rendering the act of respiration laborious, and almost impossible. Inflammation of the larynx, to which cattle are much subject, rendering labour of breathing is scarcely credible.

For the formation of an artificial opening into the windpipe can be done very easily and safely performed. The beast should have the hair cut closely from the throat over the windpipe, between the fifth or sixth ring. The skin is then tightened by the forceps, and an incision is made through it at least three lines deep.

This must be carefully dissected off from the parts above and below, a portion of the windpipe, half an inch wide, and an incision carefully cut out. There is no occasion for the solution of the horse, that this shall consist of equal quantities of the windpipe. A little contraction of the windpipe here would be a consequence: sufficient speed is not exacted from the ox for exercise, or even to be perceived. The lips of the wound are drawn together by threads passed through the edges and tied over the wound. The pressure or inflammation above no longer exists, and then the wound is left together and the wound healed.

What instantaneous and perfect relief this operation affords to that was struggling for breath, and seemed every moment to expire, is in a moment himself.

In cases of permanent obstruction, as tumour in the nostrils, or distortion of the trachea, the animal will generally be consigned to the slaughter. In some instances may occur in which it is desirable to preserve the animal for the sake of breeding, or for other purposes. Then a tube is introduced into the opening two or three inches long, curved at the external orifice turning downward, with a little ring on the end. By the means of tapes, it may be retained in its position. One has worked two or three years wearing a tube of this

8
Very soon after birth, however, a singular change takes place. It immediately separates from the parotid; it gradually disappears from above downwards; and in the course of a few months of it remains along the whole of the neck. It then more slowly within the chest; but at length it disappears there too, and is occupied by the thoracic duct.

It is evidently connected with the existence of the animal from birth, and more particularly with the latter stages of foetal life, to be a part of the nutritive system. It pours a bland fluid through the parotid duct into the mouth, and so into the stomach, in order to habituate the stomach by degrees to the digestive process, and prepare it for that function on which the life of the animal depends, and also to prepare the intestines for the discharge of their secretions. After birth, it begins to be separated from the parotid gland by the means of pouring its secretion into the stomach, and it gradually disappears away, and disappears.

THE BRONCHIAL TUBES.

The windpipe pursues its course down the neck, until it enters the chest. It there somewhat alters its form, and becomes denser and narrower in order to suit itself to the triangular opening through the diaphragm to pass. It enters the chest, and preserves the same cartilaginous structure until it arrives at the base of the heart, where it separates into two tubes corresponding with the two divisions of the lungs. These are the *bronchial tubes*. They plunge deep into the substance of the lungs, and these presently subdivide; and the subdivision is continued until branches of the trachea penetrate every portion of the lungs. These are still air-passages, and they are carrying on the animation for the accomplishment of a vital purpose. The lungs afford the most satisfactory elucidation of the manner in which the bronchial tubes traverse that viscus. They can be followed until they are lost to the unassisted sight, but the greater part of them can be easily traced into the *lobuli*, or little divisions of the substance of the lungs, so evident here. The minute structure of these lobuli has been demonstrated; but we may safely imagine them to consist of small cells in which the bronchial tubes terminate, and to which air is conveyed; and that these cells are divided from each other by delicate membranes.

cle to the power of chemical affinity or attraction; and it contains is attracted by the oxygen which abounds in air, and is taken out of the circulation, and empoisons of the blood. Carbonic acid gas, or fixed air, is formed the oxygen and the carbon, the presence of which in renders the air destructive to life. The other components of blood have also an affinity for oxygen, and more of that from the atmospheric air, and passes through the membrane-cells, and mingles with the blood.

then, from venous to arterial blood consists in the carbonic acid, and oxygen imbibed; and this is effected by the blood coming nearly into contact with atmospheric air, of which oxygen is a part, and which has a greater affinity for carbon, and other parts of the blood, than it has for the gases with which it was in the constitution of atmospheric air.

The vessels, now carrying arterial instead of venous blood, pass through larger and yet larger vessels, until the united stream is received in the right cavity of the heart, thence to be propelled through the lungs. This subject has been treated at somewhat greater length, as the dissections of the ox afford the best illustration of the division of the bronchial tubes, and the separation of the substance of the lungs into lobes, or little lobes, in which the bronchial tubes terminate, and are developed.

CATARRH OR HOOSE.

Detail may now, for a considerable time, be laid aside, and we enter into the diseases of the respiratory organs. Those only of the air-passages, that of the nose have as yet been considered. Inflammation has spread beyond the lining membrane of the nasal cavity, and begins to involve the fauces, the glands of the throat, and the passages generally; it is no longer coryza, but assumes the form of catarrh, or is better known in the country by the term HOOSE. It is too little regarded by the owner of cattle, but the most frequent and fatal diseases to which they are subject. We need not say whence catarrh, or common cold, arises. The treatment of management or of temperature will sometimes prove successful at the beginning of spring, and towards the latter part of the year is particularly prevalent. Young beasts, and cows after calving, are most liable to it. In a great many cases, however, it is the result of

extent, and been pursued in defiance of many a warning, but actually occurring, difficult to remove, and degenerating into phthisis, will painfully, but somewhat too late, convince the mistake.

The principal error, however, of the agriculturist is not that he does not know the causes of hoose to exist, or always gives them existence; but that he underrates the mischievous and fatal character of the disease. At this point we shall have to refer again and again; and if we could only get him to listen to the dictates of humanity and of interest, this treatise may rank among those which have diffused scientific knowledge.

There is no disease of a chronic nature by which cattle are injured, or which is eventually so fatal to them, as hoose; and yet the herdsman in twenty, and very few of those whose interests are at stake, pay the slightest attention to it. The cow may cough a week, and no one takes notice of it until the quantity of milk is seriously decreasing, or she is rapidly losing flesh, and then treatment is generally unavailing. The disease has now reached the lungs are seriously affected; and the foundation is laid for consumption.

It is far from the wish of the author to inculcate a system of nursing. He knows full well that those cattle are most heavily exposed to the usual changes of the weather, yet somewhat sheltered from its greatest inclemency. He would not consider even a hoose as a sick animal, and shut her up in some close place, and drench her, but he would endeavour to prevail on the farmer to look out a great deal more on the look out. The farmer or the herdsman should be aware of every beast that coughs. It may be only a cold, and in a few days may disappear of itself. He may wait and see if it will unless there are some urgent symptoms; but, the cough having passed, and the cow continuing to hoose, it becomes comparatively necessary for him to adopt the proper measures which may be serviceable.

Let her be taken up and examined. Does she feed as usual? Does the dew stand upon her muzzle? Are her flanks pebbled? Then one or two nights' housing, and a mash or two, or a drench may set all right. But if, on examination, the muzzle is a little hot, the root of the horn hot, and she heaves (although not coughs), the flanks, and the coat is not so sleek as usual, and she is a little out of feed, let her be bled. Experience will teach the farmer the

er and of worse diseases, and it is strangely fatal. If a spring succeeds to a wet and mild winter, there will be a straw-yard in some districts in which a considerable will not labour under distressing hoose. Obstinate is the early stage of this disease, on which neither common salt, nor linseed oil, can make any impression. Into the rumen, and has for a while no power on the cuti-stomach; and then, whether the purgative course is pursued, diarrhœa suddenly comes on, and bids equal defiance to medicines. Sometimes, however, diarrhœa is present and at the very beginning.

At the head, the roots of the ears, the neck, the back and many of the joints, soon succeed, accompanied by a cracking sound when pressed upon. There is decomposition here, and in the cellular texture among the rest, accumulation of gas, the passage of which among the cells is the cause of this crackling.

Humours indicate decomposition in one part, the appearance of fæces show that it is not inactive in the intestinal canal. As the disease becomes more offensive to a high degree, the breath loses its peculiar character, and the vital powers are rapidly exhausted.

In these epidemics the first attack seems to be made on the

I scarcely believe that, in the nineteenth century, a work was published of cattle, and which had an unexampled sale, in which the following was recommended as powerful in removing 'fever and inflammation of the lungs, &c. &c. kind.' There is not a single good ingredient in the whole mixture: it is a collection of drugs, and the bulk is made up of absolute poison.

Sulphur, two ounces; Barbadoes tar, one ounce; the yolks of two eggs: beat the sulphur in a large basin until they are properly incorporated, then add the tar, and beat in min-seeds, elecampane-root, grains of paradise, and liquorice-root, to make a powder. Salt of tartar, half an ounce; honey, four ounces. Mix the powder with a little at a time, constantly stirring, one quart of warm ale or beer. As it is used, add a wine-glass of gin or brandy, and give it when new-

At the commencement of the disease, one or two of the drinks are given to remove the complaint. Its effects are powerful in removing and dissolving humours from the pulmonary vessels, and in restoring them to their regular action. It warms, stimulates, and gives fresh action to the stomach and bowels, and the nature will return to its regular course, and the health of the animal.

From Clater's 'Every Man his own Cow-doctor.' We will, however, not be the purveyors of that work; they have endeavoured to keep pace with the times: all this, worse than nonsense, is expunged, and the work has a respectable character.

powers of organic life, and soon afterwards the animal system shares in the deleterious influence. The beast is unwilling to move; it scarcely can move; it staggers as it walks. It loses flesh every day; the coat stares, and clings to the bones; the appetite is quite gone; a fœtid discharge commences from the mouth and nostrils, and death soon follows.

The treatment of this disease in its early stage, and when alone it can be treated with reasonable hope of success, may be characterized under two words—promptitude and vigour. The state of inflammatory fever which accompanies the early period of the disease is intense; and unless arrested it will (as we have seen in treating of that disease) speedily exhaust every vital power; therefore, fever existing, bleeding is imperative. The quantity of blood to be abstracted will be regulated by the intensity of the inflammation, the apparent approach or commencement of debility, and the effect produced while the blood continues to flow. All of these circumstances should be most carefully attended to. If the fever rages, the ox will bear to lose a much greater quantity of blood than the horse, and uniformly with manifest advantage. If the state of debility is evidently approaching, or has even commenced, bleeding, regulated by the pulse, and stopped the moment that that falters, will generally be beneficial: but, debility being established, or the bleeding carried on, after the pulse has forbidden it, the abstraction of blood will only hasten the catastrophe.

Aperients should undoubtedly be administered, accompanied or not by aromatics, or the proportion of the aromatic regulated by the preponderance of fever or debility. The sulphate of magnesia will be preferred; and early recourse should be had to the stomach-pump, in the manner which has been already described, should the physic seem to accumulate in the paunch.

The other medicines will also be regulated by the symptoms. While fever continues, the digitalis emetic tartar and nitre will be indicated. When the febrile stage is passed, spirit of nitrous ether, laudanum, gentian, and ginger will be indicated. The cow-house should be warm, yet well ventilated. Mashies should be given, and green meat of every kind, and this changed daily, if necessary, in order to humour the capricious appetite of the patient. The strength being a little renovated, the beast may be turned into some pasture, close at hand, for a few hours during the middle of the day.

THE MALIGNANT EPIDEMIC.—MURRAIN.

Epidemic catarrh much oftener assumes a malignant form in cattle than in horses, on account of the greater vascularity of the system, and intensity of febrile action, and consequent vital exhaustion. It also appears as a disease which is malignant from its very commencement. In former times it was the pest of cattle, while horses comparatively escaped; and, in the present day, there is no disease of the horse, with the exception of farcy and glanders combined, so malignant as the murrain of cattle. It once used to sweep away the horned stock of whole districts, and there are few years in which it is not now seen in some part of the kingdom. It is here ranked under the diseases of the respiratory system, because that system is usually first of all affected, and for a longer or shorter time alone affected; but the disease gradually takes on a typhoid character, and its pestilential influence invades every portion of the frame. It principally appears in marshy and woody districts, or where under-draining has been neglected, or the cattle have been exposed and half-starved.

There are few diseases that assume, in its earlier or later stages, a

greater variety of forms; but, disarmed of somewhat of its virulence in modern times, or at least having not appeared in all its terrors for some years past, it will generally be distinguished by some or the greater part of the following symptoms.

There will be cough, frequent and painful, and, in many cases, for a week or more before there is any other marked symptom. The farmer may not always be aware of this, but he will find it out if he inquires about it; and he will be fully aware of the importance of the fact before we have done with this division of our subject.

After a few days some heaving of the flanks will be added to the cough; the pulse will be small, hard, frequent, and sometimes irregular; the mouth hot; the root of the horn cold; the fæces sometimes hard and black, at others liquid and black, and then very fœtid. Presently afterwards, that of which we have to speak again and again, is observed—extreme tenderness along the spine, and particularly over the loins.

The cough becomes more frequent and convulsive, and a brown or bloody matter runs from the nostrils and mouth; the eyes are swelled and weeping; the patient grinds his teeth; there is frequent spasmodic contraction about the nostrils; and the animal rarely lies down, or, if he does, rises again immediately.

The eyes soon afterwards become unusually dull; the pulse remains small, but it has become feeble; the respiration is quicker; the flanks are tucked up; the tenderness on the loins is removed; insensibility is stealing over the frame; and the fæces are more loaded with mucus, and more fœtid. The patient moans and lows, and grinds his teeth almost incessantly; the head is agitated by a convulsive motion; blood begins to mingle with the fæces: the breath, and even the perspiration, become offensive; and the beast staggers as he walks.

Tumours and boils now, or often earlier, appear on various parts. If they are to come forward, the sooner they rise the better, for much depends on what becomes of them. If the animal has sufficient strength for them to go through the usual process of suppuration, although the sloughing and the stench may be greater than could be thought possible, the beast will have a chance to recover; but if there is not energy to bring them forward—if they become stationary—and, most assuredly, if they recede and disappear, the patient will die.

The treatment of this disease is most unsatisfactory. If the farmer could be brought to attend more to this cough in cattle,—if, here, he had recognised the violent and increasing cough,—and, although he had not dreamed of murrain, had bled and physicked the beast on account of the cough, the disease would probably have been arrested, or at least its virulence would have abated.

The early stage even of murrain is one of fever, and the treatment should correspond with this—bleeding. Physic should be cautiously yet not timorously resorted to. For sedative medicines there will rarely be room, except the cough should continue. Small doses of purgative medicine, with more of the aromatic than we generally add, will be serviceable, effecting the present purpose, and not hastening or increasing the debility which generally is at hand; but if the bowels are sufficiently open, or diarrhœa should threaten, and yet symptoms of fever should be apparent, no purgative must be given, but the sedatives should be mingled with some vegetable tonic. The peculiar fœtid diarrhœa must be met with astringents, mingled also with vegetable tonics. In combating the pustular and sloughing gangrenous stage, the chloride of lime will be the best external application; while a little of it administered with the other

medicines inwardly may possibly lessen the tendency to general decomposition. The external application of it should not be confined to the ulcerated parts alone, but it should be plentifully sprinkled over and about the beast; and the infected animal should be immediately removed from the sound ones.

There is no satisfactory account of the malignant distemper which occasionally appeared in former times, and swept away almost the whole of the cattle in many districts. Those which do exist were written mostly by physicians. They were the best chroniclers, certainly, which the age afforded, but they knew little about cattle either in sickness or health; and were not aware how little many of the principles of human medicine apply either to the theory or the treatment of the diseases of cattle; and (most to be lamented, and most disgraceful to the parties) the farmer would not furnish the physicians with sufficient relations of the symptoms, but purposely misled them, because they had recommended to the government restrictions with regard to these diseased cattle inconsistent with the inattention, prejudice, and fatalism of the owners.

An endeavour will here be made to supply this chasm in the history of cattle, and to collect a connected account of these devastations. It will be useful and not uninteresting as a record, and it will throw considerable light on the nature of the disease which yet remains, but, fortunately for the farmer and his cattle, under an incomparably milder form.

The earliest record we have of murrain is the destruction of the cattle of the Egyptians (Exod. ix. 2, &c.): 'If thou refuse to let them go, behold the hand of the Lord is upon thy cattle which is in the field; there shall be a very grievous murrain. To-morrow the Lord shall do this thing in the land. And the Lord did that thing on the morrow, and all the cattle of Egypt died.'

During the siege of Troy vast numbers of the cattle of the Greeks, and of the Greeks themselves, are said to have perished by a pestilence. Homer, the father of Grecian poetry, who is supposed to have written about 900 years before Christ, in attributing the disorder to the arrows of Apollo, might have meant only to suggest that the cause of these malignant diseases was in the air: and thus, perhaps, brutes receive the contagion first, because their sense of smell is more acute than that of the human being*.

Hippocrates, who flourished about 500 years after Homer, and is the earliest writer on medicine, while he justly ascribes all disorders to divine agency, yet combats this supernatural and judicial interference, as the offspring of superstition and hypocrisy †.

Plutarch tells us that, during the reign of Romulus, a pestilence, after destroying the fruits of the earth and the cattle, swept off many of the Romans; and Livy, speaking of another visitation of the pest, says that the consuls had the greater difficulty in raising their recruits, because the plague which the year before had raged among the horned cattle had then broken out among the men ‡.

Virgil, in his 'Georgics,' by very far the most beautiful of his poems,

* Οὐρῆας μὲν πρῶτον ἰπαρχετο καὶ κύνας ἄργους
 Ἄνταρ ἔπειτ' αὐτοῖσι βέλος ἰχθυεὺς ἀφίει
 Βάλλ.—Iliad, lib. i.

On mules and dogs th' infection first began,
 And last the vengeful arrows fixed in man.—Pope.

† Περὶ Ἰσθμ. Νεσθ.

‡ Delectus consulibus eo difficilior erat, quod pestilentia quæ priori anno in boves ingruerat, eo verterat in hominum morbos.—Liv. lib. xli.

and containing many good agricultural precepts, which modern improvements have not rendered obsolete, gives a long history of the murrain as it devastated some of the Roman farms*. He wrote about 50 years before the Christian era.

* The picture is drawn from the very life, and the reader will forgive the length of some of the extracts.

Hic quondam morbo cœli miseranda coorta est
 Tempestas, totoque autumnu incanduit æstu,
 Et genus omne neci pecudum dedit, omne ferarum,
 Corruptique lacus, infecit pabula tabo.
 Nec via mortis erat simplex, sed ubi ignea venis
 Omnibus acta sitis miseros adduxerat artus;
 Rursus abundabat fluidus liquor; omniaque in se
 Ossa minutatim morbo collapsa trahebat.
 Sæpe in honore Deum medio stans hostia ad aram,
 Lanea dum nivea circumdatur infula vitta,
 Inter cunctantes cecidit moribunda ministros.
 Aut si quam ferro mactaverat ante sacerdos;
 Inde neque impositis ardent altaria fibris,
 Nec responsa potest consultus reddere vates;
 Ac vix suppositi tinguntur sanguine cultri,
 Summaque jejuna sanie infusatur arena.

Georg. lib. iii. ver. 478, &c.

Here from the vicious air and sickly skies
 A plague did on the dumb creation rise:
 During th' autumnal heats th' infection grew,
 Tame cattle and the beasts of Nature slew,
 Pois'ning the standing lakes and pools impure;
 Nor was the foodful grass in fields secure.
 Strange death! for, when the thirsty fire had drunk
 Their vital blood, and the dry nerves were shrunk,
 When the contracted limbs were cramp'd, ev'n then
 A wat'rish humour swell'd and ooz'd agen,
 Converting into bane the kindly juice,
 Ordain'd by Nature for a better use.
 The victim ox, that was for altars prest,
 Trimm'd with white ribbons and with garlands drest,
 Sunk of himself, without the God's command,
 Preventing the slow sacrificers' hand.
 Or, by the holy butcher if he fell,
 Th' inspected entrails could no fates foretell;
 Nor laid on altars, did pure flames arise;
 But clouds of mould'ring smoke forbade the sacrifice.
 Scarcely the knife was redden'd with his gore,
 Or the black poison stain'd the sandy floor.—*Dryden.*

It would seem that the disease assumed in that part of Italy the character which it does there, and on the continent generally, at the present day, much oftener, and to a greater extent, than is seen in our country: it is what the French call "Fièvre pernicieuse carbonculaire." It is not merely that inflammation of the cellular texture beneath the skin, so peculiarly the disease of cattle, which causes general tenderness wherever the animal is touched, and pain which he cannot bear when he is pressed on the loins; but it proceeds to the formation of tumours, carbuncles, ulcers, and deposit of purulent fluid everywhere. When the animal is examined after death, no blood follows the knife, but a yellow, or glairy, and pus-like fluid; and this not only immediately beneath the skin, but deep between the muscles. Even during life there is a kind of bloodlessness, and the knife must penetrate deeply in order to find the vital fluid. The latter part of the above quotation refers to this; the former to the effusions either in the thorax or abdomen, which are sometimes found on examining cattle that have died of murrain.

Hinc lætis vituli vulgo moriuntur in herbis,
 Et dulces animas plena ad præsepia reddunt.
 Hinc canibus blandis rabies venit, et quatit ægros
 Tussis anhela sues, ac faucibus angit obesis.
 Labitur infelix studiorum, atque immemor herbæ
 Victor equus, fontesque avertitur, et pede terram

Our accounts of this disease are now few and meagre for many a century. In the year 376 after Christ, a murrain broke out among the cattle over the whole of Europe. The historian is Cardinal Baronius, who, either deeply imbued with the superstition of the age, or scrupling not to support a noble cause by means unworthy of it, says that 'none escaped but such as were marked on the forehead with the sign of the cross, by which miracle many people were converted to Christianity *.'

In 810 every head of cattle was destroyed in the Emperor Charlemagne's army, and also throughout the greater part of his dominions †. In 1514, and again in 1599 ‡, the Venetian states were so ravaged by it, that to

Crebro ferit: demissæ aures: incertus ibidem
Sudor, et ille quidem moriturus frigidus: aret
Pellis, et ad tactum tractanti dura resistit.
Hæc ante exitium primis dant signa diebus.
Sin in processu cœpit crudescere morbus,
Tum vero ardentes oculi, atque attractus ab alto
Spiritus interdum gemitu gravis: imaque longo
Ilia singultu tendunt: it naribus ater
Sanguis, et obsessas fauces premit aspera lingua.
Ecce autem duro fumans sub vomere taurus
Concidit, et mixtum spumis vomit ore cruorem,
Extremosque ciet gemitus: it tristis arator,
Mœrentem abjungens fraterna morte juvenum,
Atque opere in medio defixa relinquit aratra.
Non umbræ altorum nemorum, non mollia possunt
Prata movere animum, non qui per saxa volutus
Purior electro campum petit amnis: at ima
Solvuntur latera, atque oculos stupor urguet inertes,
Ad terramque fluit devexo pondere cervix.—

Georg. lib. iii. ver. 494, &c

The thriven calves in meads their food forsake,
And render their sweet souls before the plenteous rack.
The fawning dog runs mad; the wheezing swine
With coughs is chok'd, and labours from the chine:
The victor horse, forgetful of his food,
The palm renounces, and abhors the flood.
He paws the ground, and on his hanging ears
A doubtful sweat in clammy drops appears:
Parch'd is his hide, and rugged are his hairs.
Such are the symptoms of this young disease;
But in time's process, when his pains increase,
He rolls his mournful eyes; he deeply groans
With patient sobbing, and with manly moans.
He heaves for breath; which from his lungs supplied
And fetch'd from far, distends his lab'ring side.
To his rough palate his dry tongue succeeds;
And ropy gore he from his nostril bleeds.
The steer who to the yoke was bred to bow
(Studious of tillage, and the crooked plough)
Falls down and dies; and, dying, voids a flood
Of foamy madness, mix'd with clotted blood.
The clown, who cursing Providence, repines,
His mournful fellow from the team disjoins;
With many a groan forsakes his fruitless care,
And in th' unfinish'd furrow leaves the share.
The pining steer nor shades of lofty woods
Nor flow'ry meads, can ease, nor crystal floods
Roll'd from the rock: his flabby flanks decrease;
His eyes are settled in a stupid peace;
His bulk too weighty for his thighs is grown;
And his unwieldy neck hangs drooping down.—*Dryden.*

* Layard, on the Contagious Distemper among Horned Cattle, p. 11.

† Lancisi de Bovilla Peste. Part III. p. 110.

‡ Rammazini de Contagiosa Boum Epidemia. Ed. Lond. 1717, p. 456.

prevent the supposed ill consequences of eating the flesh of tainted beasts, as well as to save the little remnant of cattle that was left, all beef and veal were forbidden by the senate to be eaten throughout their state.

The *Journal des Savans* for 1682 contains an account of an epidemic which destroyed a great number of cattle in most of the provinces of France. The history of its symptoms shows how little was then known of the diseases of cattle, or how careless were the examinations that were made even by scientific men, and for the purpose of enlightening the public. The animals ate and worked as usual until they fell dead in a moment. The explanation of this is a little marvellous, and does not quite agree with the previous story. 'A violet-coloured vesicle is found under the tongue, on which an eschar or scab forms in five or six hours, and on the falling of the eschar, the animal dies; and when he was opened, the intestines were in a state of gangrene, and so was the tongue, for it often fell to pieces.' This was the gloss-anthrax, or blain which has been already described, but of a very malignant character, and associated with murrain, as it is now sometimes found to be; but the marvellous story of the animal dropping all at once betrays inattention or ignorance, or both, and makes us a little cautious how we implicitly trust to the records of those times. The practitioners of that day had, however, a glimpse of the mode of treatment on which alone the slightest dependence can be placed, for they rubbed the part (the vesicle under the tongue) with a piece of silver, *until it bled*, and then they washed the wound with vinegar, well seasoned with pepper and salt.

It was in 1711 that the epidemics commenced, which, although sometimes suspending their ravages for a few years, or rather visiting new districts when they ceased to desolate others, continued to be objects of terror until the establishment of veterinary schools.

The origin of the epidemic of 1711 seems to be clearly traced*. Some cattle-merchants were importing, according to their annual custom, beasts from Dalmatia, which were in request in some parts of Italy. One of these oxen being taken ill, and straying from the herd, was abandoned by the merchants in the neighbourhood of Padua. A servant of the canon of Padua found him, and, whether with or without the knowledge of his master does not appear, took possession of him, and put him into a cow-house among others that were perfectly well. In a few days he died; but not until he had infected every beast; and so surely that they all perished except one, in whose neck setons had been placed†. The contagious nature of the disease (for the contagiousness of true murrain cannot for a moment be doubted), finding a too powerful auxiliary in some peculiar state of the atmosphere at that time, the malady quickly spread through the whole Venetian territory.

Two Italian physicians, Rammazini and Lancisi, have left us more intelligible and consistent accounts of it than we have of any of the epidemics which speedily followed on the continent of Europe, or of those that occurred in our own country nearly half a century afterwards.

By giving a short sketch of it as it appeared in Italy, there will be less occasion to dilate on the succeeding epidemics of the Continent. It commenced with a shivering fit, followed by unnatural heat, extreme thirst, difficulty of breathing, and general debility. A thick mucous discharge from the nose and mouth speedily succeeded, attended by a very un-

* Vid. Rammazini et Lancisi.

† Rammazini de Contagiosa Epidemia, p. 456. See also Hira on the Mortality of Horned Cattle, p. 16.

pleasant smell. There were twitchings of various parts of the frame; frequent foetid and bloody ejections; and the appetite and rumination ceased. On the fifth day there was a pustular eruption in the mouth, which covered the tongue and the pharynx; and abscesses followed, and the bones beneath quickly became carious. The cattle died generally on or about the fifth or ninth day.

The hair usually came partly or entirely off. If after the fall of the hair, the skin became firmer; or if the disease attacked the legs or thighs, and there were swellings of the joints, or about the limbs, and which almost prevented the motion of the animal, he generally recovered. Cows that gave milk often survived, but their calves uniformly perished.

On examination after death, hydatids were found in the brain and lungs; and it was said that they contained an infectious gas that could scarcely be endured. If this were the case, they were vesicles formed by the extravasated air in the process of decomposition, and not hydatids. Ulcers were found at the root of the tongue, and gangrene in the intestines. The third stomach always contained a hard, black, infectious mass, which adhered to the lining membrane, and could scarcely be separated from it.

Lancisi says, that he found no medicine effectual against this complaint. Setons and the actual cautery were sometimes serviceable. Rammazini fully confirms this, and says that the cattle in which either setons or the cautery, or natural tumours and ulcerations had produced a copious discharge of thick, purulent and foetid matter, were the only ones that escaped*.

The pest was soon propagated over the greater part of Italy. It appeared in Milan, under even a more virulent character than it had assumed in the Venetian States; and when it reached the duchy of Ferrara, it had so fearfully acquired strength as it proceeded, that it was the prevalent opinion among the best-informed persons in the duchy, that the whole species of horned cattle would quickly become extinct. As it travelled it selected other victims; horses, deer, swine, and domestic poultry of every kind were attacked by it.

As might be supposed, the most absurd ideas were entertained of its nature and cause. Many of the beasts that had died in the preceding year had not been buried deep enough, and clouds of hornets had burrowed down to them, and fed on the putrid flesh. It was confidently affirmed that a great proportion of the cases of murrain might be traced to the empoisoned sting of these hornets. Some persons pretended to find the black stings of these winged insects in different parts of the animals†.

In 1714 it reached Piedmont, still apparently increasing in malignity. According to Fantoni, Professor of Medicine at Turin, more than seventy thousand cattle perished in that little territory‡.

From Piedmont, it easily found its way into France. All the provinces of the south of France, and bordering on Germany, were devastated by it. And now its progress was rapid and murderous to a fearful degree; for before the end of the year, it had reached Brabant and Holland, in the latter of which at least two hundred thousand cattle perished; and it had crossed the channel to England, where it was as destructive as on the Continent: but of its history and specific character in Britain there is not any authentic record.

The disease afterwards began to exhibit new symptoms. If it first

* Vid. Rammazini, et Lancisi in loc.

† Ibid.

‡ Hurtrel D'Arboval (Typhus).

attacked the membrane of the nose it sometimes confined its virulence to that and the neighbouring parts, and the malady assumed the precise form of malignant acute glanders. The septum was ulcerated through and through, and the horse and the ox died, in consequence of the local mischief there done, and the constitutional irritation consequent upon it, without determination of the malignant principle to any other part.

If the first attack was on the alimentary canal there the fury of the disease was expended, and the animal was destroyed by dysentery: if the membrane of the mouth was affected, it was soon covered by tumours, of greater or less size, and many of them running on to ulceration.

The extensive ravages of murrain seemed now for awhile to cease; but it frequently appeared in certain districts, confining itself to them, but being there murderous enough, and exciting the too well-grounded fear that it would break out again, clothed with all its terrors.

In 1731, the epidemic of 1682 seemed to return. Glossanthrax, or blain, of a malignant character, was prevalent in many of the provinces of France, and very fatal there.

The vesicle formed most rapidly, and, if neglected, suffocated the animal in less than twenty-four hours; or, if the vesicle broke, it was succeeded by a chancrous ulcer, far more corroding than chancres generally are, and which, destroying the tongue and the posterior part of the mouth, produced the death of the animal. The incomprehensible story was again revived (there were no veterinary surgeons yet), that the beast continued to eat and to drink, and to appear well, until the tongue fell piecemeal from the mouth.

The cause of the disease was supposed to be the same as in 1682, and it fared even worse with the horse than it did with the ox.

In 1743 and 1744, it appeared again, with increased fury, in the north of France, and great part of Germany.

In 1745, it laid Holland waste a second time. More than 200,000 cattle now perished. In the same year, it again found its way to the coast of Britain. It seems to have been clearly brought to us from Holland, although there are two versions of the story. Dr. Mortimer says that it was imported by means of two white calves which a farmer at Poplar sent for, in order to cross his own breed; and that it spread into Berkshire by means of two cows that were brought out of Essex. The other account is, that one of our tanners bought a parcel of distempered hides in Zealand, and which were forbidden to be sold there, and should have been buried, and so transplanted this dreadful disease among us. "Thus by one man's unlawful gain," says Dr. Layard, "if by this way it was conveyed, the ruin of many graziers and farmers was effected." It is certain, however, that the pest first appeared in the immediate neighbourhood of London, and on the Essex side of the river, and that thence it gradually spread through Essex and Hertfordshire, and the whole of the kingdom.

For more than twelve years it continued to lay waste the country. The number of beasts that were actually destroyed by it was not, and perhaps could not, be ascertained; but, in the third year of the plague, when the government had so seriously taken up the matter as to order that every beast that exhibited the slightest marks of infection should be destroyed, a remuneration being made to the owner, no fewer than 80,000 cattle were slaughtered, besides those which died of the disease, and which formed, according to the narration of one of the commissioners, nearly double that number. In the fourth year of the plague they were destroyed at the rate of 7000 per month, until, from the numerous impositions that

were practised, this portion of the preventive regulations was suspended.

In the year 1747, more than 40,000 cattle died in Nottinghamshire and Leicestershire, and in Cheshire 30,000 died in about half a year.

The symptoms of the disease are best described by Drs. Brocklesby and Hird, who, with many other medical men, exerted themselves in the most praiseworthy manner to ascertain the nature and method of cure, or the prevention, at least, of this dreadful malady. Dr. Layard's work is the most laboured performance; but he drew too much from Hippocrates, and Sydenham, and Aldrovandus, and Aretæus, and gives us far too little of the result of his own observation.

The disease generally commenced with a dry, short, husky cough, as it does at the present day; but, as cattle are very subject to hoose, and particularly in the spring and fall, this, although it continued without any other symptoms for eight or ten days, was generally overlooked. At length the coat began to appear unhealthy; the eyes were heavy; rumination ceased; the animal refused all food and drink; the milk began to decrease; it acquired an unpleasant taste; it became yellow, and soon afterwards dried up.

These were precursory symptoms. The real and serious attack of the disease was a shivering fit, succeeded by an intense heat and uncertain remissions. The eyes became more heavy and dejected, and the conjunctiva inflamed. The cough was now more violent, and respiration so difficult that the animals seemed to struggle and pant for breath.

A swelling became visible externally about the glands of the throat, which, in some cases, became so large as to threaten immediate suffocation. The tongue and internal part of the mouth were hot and slimy; the head hung down; the ears drooped; there was an unusual listlessness and unwillingness to stir; a choice of solitude; a separation from the rest of the herd; and an evident dislike of being, in the slightest degree, disturbed.

The bowels were at first costive, but looseness succeeded in less than forty-eight hours after the shivering fit. The excrement was at first green, watery, and intolerably foetid; but it afterwards altered to a viscid slimy matter. The purging continued, in fatal cases, through the whole of the disease; in those that recovered, it began to abate about the seventh day. The existence of this looseness for a while was necessary to the favourable termination of the disease; for all in whom it did not appear within a few days after the shivering fit died.

A considerable foetid discharge proceeded in every case from the nostrils, and, in some instances, from the eyes and mouth. It was thinner, and of a more serous nature in the animals which died of the distemper; but more consistent and better digested in those that recovered.

If the disease terminated fortunately, the inner surface of the mouth, and the glands of the throat continued to have a healthy, inflammatory blush, without any tendency to gangrene or mortification. Internal ulceration was generally regarded as a most unfavourable symptom; but if the external swellings, whether of a greater or less size, which usually appeared, about the third or fourth day, broke, and discharged a great quantity of stinking purulent matter, the beast usually did well, although the ulcers occasionally spread to a most fearful degree, and were always very difficult to heal. Most of the beasts had a universal emphysema, or crackling under the skin, and this in some proceeded to a very strange and curious extent.

The continuance of the disease was very uncertain. Some died almost

suddenly; in others, inflammation of the brain seemed to come rapidly on, and the cattle became so furious and dangerous, that it was necessary to destroy them. Most died on the sixth or seventh day, and very few lived on to the eleventh. The approach of death was usually indicated by the mouth becoming cold, the breath fœtid and cadaverous, the eyes sunk in their orbits, the skin tense and clinging to the bones, and especially the horns and teats becoming intensely cold.

The recovery was generally very rapid. On one day a beast appeared in extreme distress, with every symptom urgent, and in less than four-and-twenty hours rumination had returned, the milk flowed free, and of its natural colour, and she turned to the crib with some degree of appetite.

On dissection the paunch was always found very much distended with food.* In the second stomach there was nothing unusual; but on the third being cut into, there generally flowed from it a great quantity of thin greenish water, of a most offensive smell. The fourth stomach exhibited marks of inflammation, sometimes running on to gangrene. The intestines had patches of inflammation, or gangrene; but the liver, the spleen, and the kidneys were scarcely affected. The lungs exhibited traces of the intensest inflammation; they were usually congested with blood, while purulent matter ran from every part of the bronchi.

The disease was evidently epidemic. It would cease, in a great degree, towards the approach of summer. During one or two summers, in the twelve years that it raged, it seemed to have altogether disappeared; but at the approach of winter it broke out afresh, sometimes in districts, the cattle of which it had previously thinned; at other times, in places which had hitherto escaped its fury, and very distant from those in which it had seemed gradually to die away. It prevailed most generally and was most fatal towards the latter part of the winter. February and sometimes March were destructive months. There was also a strange caprice about it. It would select its victims here and there. It would carry off half the cattle in every dairy round a certain farm, and not touch a single beast there; but six months afterwards, it would return, and pounce upon this privileged spot, and not leave one animal alive. There were other instances in which, although it attacked the cattle on a certain farm, it readily yielded to the power of medicine, or to that of nature, and not one in a dozen was lost; while on a contiguous farm, the soil, the produce, and the management being apparently the same, not one in a dozen was saved. Its virulence evidently depended on some mysterious atmospheric agency.

Was it contagious as well as epidemic? This seems to have been taken for granted by every one who had opportunity of observing the disease; and on this were founded the orders in council for the non-removal of infected beasts, the slaughter of them, and their burial within three hours after death.

That it was communicable by immediate contact there can be little doubt. The history of its introduction into Padua, and its propagation through the neighbouring territory, were sufficient proofs of this. That it might be communicated in a more indirect way, by the contact of the person or thing that had been near or had touched the deceased animal, was probable enough, and there were said to have been numerous instances of it; but, as is natural in these cases, the public were a great deal more frightened about the matter than the real danger would justify.

The disease had far more of an epidemic than of a contagious character about it; and all that was really necessary, or could be of avail in those cases, (and in the same disease, when it appears in the present day,) was to remove the infected animal from all possible contact with others as soon

as possible ; to destroy all the litter and forage which was left behind ; to burn the less valuable harness or utensils ; to scour the place well with chloride of lime ; and to forbid those who attended on the sick beasts from having anything to do with the healthy ones.

The contagion would now be limited in virulence and extent ; and, in many cases, it would be altogether destroyed by the plentiful use of the chloride of lime.

It was also very proper to have the carcasses buried as soon as possible. After such diseases the body runs to decomposition very rapidly, and the neighbourhood of a mass of putrid matter cannot at any time be conducive to health.

As to the using for human food the flesh of an animal that had died of such a disease, common decency would forbid it. The law which prohibits the flesh of an animal that had perished by any disease from being eaten, is a very proper one ; for it is impossible to say, however strong may be the antiseptic power of the stomach, or the power of converting a semiputrid matter into wholesome nutriment, that injurious effects might not be produced on constitutions debilitated, or predisposed to disease.

There were stories of pigs, and dogs, and ducks having perished in consequence of eating the flesh of an animal that had died of murrain ; but, on the other hand, Dr. Brocklesby relates a story of a countryman who had often solicited a butcher to give him a beef-steak : at length the butcher, tired with the fellow's importunities, determined to satisfy his desire, and presented him with a large slice of meat from a beast that had died of murrain. The clown was thankful enough, and soon afterwards he returned with fresh solicitations for such another steak. After three weeks had elapsed, the man was pointed out to Dr. Brocklesby, and was apparently in perfect health ; but he certainly did not know what kind of meat he had eaten.

Inoculation for this disease was tried by some celebrated agriculturists, and particularly by Sir William St. Quentin, of Scrampton, in Yorkshire. Eight calves were inoculated ; seven of which had the distemper and recovered, and were afterwards turned into a herd of infected cattle, without being diseased a second time.

He likewise inoculated an old ox, which had the distemper from inoculation and recovered. This beast was afterwards turned into a herd of infected cattle, and continued in the pasture with them until they were all dead ; he was then put with another herd of infected cattle, but still he escaped.

Dr. Layard produces some singular testimonies to this effect. He speaks of one farmer who had eight cows that survived the distemper in 1746, and which, when the disease was again among his stock in 1749, 1755, and 1756, were in the midst of the sick cattle, lay with them in the same barns, ate of the same fodder, and even of such as the distempered beasts had left and slavered upon, drank after them, and constantly received their breath and steam, without being in the least affected. The farmers were so assured of this, that they were always ready to give an advanced price for those who recovered.

By order of council, boards of health were established in various parts of the kingdom. They had instructions to prevent the sale or removal of cattle from one district to another ; to cut off all communication between the healthy and infected parts of the country ; to kill every beast that they deemed to be infected, and to see that every beast that died was

immediately buried. They were likewise charged with the institution of certain means of cure and more particularly of prevention.*

* As a matter of curiosity, we put upon record, the first legislative enactment on such a matter.

First Commission, March 12th, 1745.

His Majesty being desirous of doing all in his power to put a stop to the spreading of the said distemper, has thought it fit, by and with the advice of his privy council (who have consulted physicians and surgeons thereupon, and they have given it as their opinion that all the methods of cure, which have been put in practice both at home and abroad, have proved so unsuccessful, that they have rather contributed to propagate than stop the infection; for while means have been using to save the sick, the disease spread amongst the sound, and is increasing more and more, in proportion to the number seized with it), to make and establish the rules and regulations following, which his Majesty does, by this order of his privy council, requiring and commanding all his subjects, in the several counties, cities, towns, corporations, and parishes, and all parts of his realm, strictly to pursue and observe, during his royal pleasure.

First. That all cowkeepers, farmers, and owners of any of the said several sorts of cattle, in any place where the said distemper has appeared, or shall hereafter appear, do, as soon as any of the said cattle shall appear to have any signs or marks of the said distemper, immediately remove such cattle to some place distant from the rest, and cause the same to be shot, or otherwise killed, with as little effusion of blood as may be, and the bodies to be immediately buried, with the skin and horns on, at least four feet in depth above the body of the beast so buried, having first cut and slashed the hides thereof from head to tail, and quite round the body, so as to render them of no use.

Secondly. That they do cause all the hay, which such infected cattle have breathed upon, and all the hay, straw, or litter that they have touched or been near, to be forthwith removed and burned; and that no person who shall attend any infected cattle, shall go near the sound ones in the same clothes.

Thirdly. That they do cause the houses, or buildings, where such infected cattle have stood, to be cleared from all dung and filth, and wet gunpowder, pitch, tar, or brimstone, to be burnt or fired in several parts of such buildings, at the same time keeping in the smoke as much as possible; and that the same be afterwards frequently washed with vinegar and warm water; and that no sound cattle be put therein for two months at least.

Fourthly. That they do not suffer any of their cattle that shall have recovered from the said distemper before the notification of this order, to be brought amongst the sound cattle, until they shall have been kept separate a month at least, and until they shall have been well curried and washed with vinegar and warm water.

Fifthly. That no person whatsoever do buy, sell, or expose for sale, the milk, or any part of the flesh or entrails of any such infected cattle; or feed, or cause to be fed, any hog, calf, lamb, or any other animal therewith; or drive, or cause to be drove, any such infected cattle to any fair or market, either in or out of the county where the said cattle now are, or to or from any place whatsoever, out of their own respective ground while they are so distempered.

Sixthly. That no person do drive or remove any of the said sorts of cattle, whether infected or not infected, from any farm or ground, where any such infected cattle are, or shall have been, within the space of one month before such removal.

Seventhly. That as soon as the distemper shall appear in or amongst any of the said sorts of cattle of any cowkeepers, farmers, or other persons, they do immediately give notice thereof to the constable of the town or parish, and also to the churchwardens and overseers of the parish or place where such infected cattle shall be, of the appearance of such infection, or to any inspector to be appointed by the justices of the peace for the district where such parish or place shall be, pursuant to the directions hereinafter given, to the end that the said officers may be the better enabled to do their duty, according to the directions hereinafter mentioned.

That no person do presume to obstruct any constable, churchwarden, or overseer of the poor, or other person, to be appointed by the justices of the peace, to assist in the execution of the powers or directions given, or to be given, in pursuance of this order.

That whosoever shall disobey these said rules, orders, or regulations shall be strictly prosecuted for the penalties inflicted by the said act.

And his Majesty doth further strictly command all constables, churchwardens, and overseers of the poor, and such inspectors, if any shall be appointed as aforesaid, as soon as they shall know, or be informed, that any of the said sorts of cattle, within their respective districts, are infected, to go to, and take an exact account of the number and sorts of such cattle in the possession of any person, distinguishing the infected from such as are not so, and to repeat those accounts weekly; and to see that the infected be shot,

They were composed of some of the magistrates of the district, and of physicians who very handsomely proffered their gratuitous services; and they laboured twelve years, and with so little avail, that at length, as it were, by a simultaneous act they dissolved themselves. They could discover no preventive—no cure for the disease, and the restrictions with regard to the sale or removal of cattle, and communication between different districts were so frequently evaded, that it was either impossible or impolitic to levy the penalties.

There was so much caprice about the disease, and beasts so often recovered after all hope had seemed to have passed away, that the farmers resisted the slaughtering of their cattle, or concealed them when they were sick; and, on the other hand, in ridicule of the competence of these judges, they brought all their old and worn-out animals, or those that were ill of totally different complaints, and had them destroyed, and claimed the remuneration which the government allowed for those that were infected with murrain.

Of the propriety, however, of this bonus for the destruction of infected cattle, there cannot be a doubt; for there were numerous instances in which those who began to kill the sick as soon as the distemper appeared among their cattle, lost very few; but others, who would kill none until their own folly had made them wiser, did not save more than one out of ten.

As to the more strictly medical part of the affair, there were such contradictory opinions among these scientific men—some maintaining that it was an inflammatory fever, and others that it was a bilious fever, and each defending his theory with so much warmth and obstinacy, that the simple farmer was first puzzled and then disgusted; and there were also such different modes of treatment recommended,—drugs both for prevention and cure, which either had never been used for the diseases of cattle, or had been proved, even by the beast-leeches of the day, to be perfectly inert in the ruminant; and all evidently founded on conjecture and hypothesis, and borrowing nothing from experience, that, in the language of Dr. Davies, “the graziers found more recover when left to themselves, than when tampered with, and that nature was a better director than an officious pretender.” Dr. Layard gives a very curious account of the matter. “Disappointed in their hopes from regular practitioners of physic, they (the farmers) despised all regular methods, and ran headlong after such remedies as were at once to remove every complaint, and were honoured by the authors with the ever-recommending title of *Infallibles*. Nor were these remedies more efficacious: tar water, Bate-

or otherwise killed, as aforesaid, removed, and buried, according to the beforementioned rule; and that all that the other beforementioned rules, orders, and regulations, and such directions as shall be given by the said justices, be punctually performed and obeyed.

And for the encouragement of the owners of such infected cattle, his Majesty doth hereby promise, that they shall be paid by the commissioners of the treasury, for every such infected beast as shall be killed according to these rules, immediately after the affection shall appear upon them, one moiety, or half the value of his such cattle, not exceeding the sum of forty shillings for each of the said sorts, excepting calves, and not exceeding ten shillings for each calf, the numbers, and values, and conformities to the said rules to be ascertained by the oaths of the owners, and two of the said constables, churchwardens, overseers, or inspectors, to be taken before one or two of the said justices, who shall certify under their hands, or the hand of one of them, the sums of money which such owners shall appear to their or his satisfaction to be entitled to, by virtue of this order, for infected beasts shot or killed, slashed and buried, according to the above regulations.

And it is hereby further decreed, that for the better notifying of this order, the same be forthwith printed and published, and also inserted in the next London Gazette.

man's drops, Godfrey's cordial, worm powders, and many other things, were all given, and all to no purpose, until, bewildered in a labyrinth of opinions, and distracted through their absurd credulity, they became as superstitious in this case for their beasts, as fatalists are with regard to themselves.* They would only bleed and give milk-pottage, because they believed these things innocent; and when by loss of blood or scouring the cattle died, they said that they left the whole to Providence. If they were cured, they said it was well; if they died, they said no one knew anything of the matter, nor could anything have done them good."

It is the character of these epidemics gradually to wear themselves out. They are frequent, and malignant, and fatal enough at first; but in process of time they become more rare, and more tractable, and at length they disappear; or they select some other country, near or remote, as the scene of devastation. About the year 1758, this epidemic was evidently declining throughout the whole of the kingdom; but it could not be said to have quite left us for several years afterwards.

In 1757, it again appeared in France, assuming a somewhat new character. It was compounded of inflammation of the tissue beneath the skin, shown by the appearance of tumours on every part, associated with acute inflammation of the lungs. It spread from cattle to horses. The poor ass is said, for the first time, to have fallen a victim to it, and these animals perished in great numbers. The stags in the neighbouring forests did not escape; and many flocks of sheep, over which these epidemics usually pass harmlessly, were swept away. The malady yielded to bleeding and purging in the earliest stage; but, being once

* For the amusement of our readers, and as a proof of the ignorance of the times, we place upon record some curious preventions and modes of cure.

The infected beast was buried alive in a hole full of mud, with nothing out but its head, for nine hours, when it was taken out quite well.

For every beast seized with murrain, a small round pie was made up, with stiff paste made of flour and butter, as is usually made for mince-pies, and as large as would hold about six ounces of tar. When the tar was put into the pie, it was covered with a lid of the same paste (it is not said whether or not it was to be baked, nor how it was to be given), and one given to each beast.

Take a gallon of human urine, if a fortnight or three weeks old the better, put into it ten handfuls of hen's dung. After ten hours' steeping, strain it off and give to each beast a pint and a half of it, throwing into each drink a good handful of rue, bruised or ground.

Take two ounces of assafoetida, the like quantities of garlic, and a handful of rue, beat them together into a kind of paste. A ball thereof, about the size of a walnut, must be put into the ear of the beast, and stitched up. This is strongly recommended by a peer of the realm.

We will add but two remedies more; the one a very pleasant, and the other a very marvellous one.

As soon as the distemper appears in any one or more of the cattle, on any farm, make some good, strong, genuine rum-punch, in proportion to the number of cattle on such farm. Then give every beast one, two, or three half-pints, in proportion to the size of the beast, and that will put an immediate stop to the contagion, or if not, it may be repeated.

A very prevalent practice was to smoke the cattle almost to suffocation, by kindling straw, litter, and other combustible matter about them; and this arose from the following circumstance, which "rests on indisputable authority." An angel was seen to descend in Yorkshire, and to set a large tree on fire. The strange appearance of the thing, or the smell of the smoke collected the neighbouring cattle around it, whether sound or infected, and those which were infected were immediately cured, and on the others was bestowed an immunity against the disease. The angel did not communicate verbally with any of the people of the district, but he left a *written direction*, that they should catch this supernatural fire, and communicate it from one to another with all possible speed; and that in case, by any unhappy means, it should be extinguished, a new fire of equal virtue might be obtained, by rubbing two pieces of wood together until they caught fire.

For some weeks the whole country was in an uproar, and the sacred fire was communicated from one farmer to another over a very great extent of country.

established, it ran its course in spite of all medical treatment, and the measures adopted usually hastened the catastrophe.

In 1758, it had spread to Finland. There it assumed another form, modified by the climate, and many local causes. Some cattle were taken all at once. There was violent trembling, amounting almost to convulsion of every limb, and blood ran from the nose, and bloody slime from the mouth, and the animal died in a few hours. In other cases the attack was not so violent; but after the shivering fit, tumours began to form between the thighs, or on the front of the breast, or beneath the jaws; when the jaws were affected, the patient was supposed to be most in danger. Diarrhœa usually followed. If it appeared early, it seemed to be an effort of nature to throw off the evil, and frequently a successful one; if it came on after the second or third day, the beast had not long to live. General bleeding was supposed to be dangerous, except in the very earliest stage of the first species of the disease. Stimulants were thought to be more useful, and particularly free and deep scarifications of the tumours, and the surface of the ulcers.

From Finland the murrain passed into Russia, and was said to be very fatal there; but we have not any satisfactory account of its progress in that country.

Half a century had now elapsed, and, with occasional remissions, and often very short ones, this malignant epidemic had prevailed, and now it had reached the very extremity of Europe. The attention of every government had been anxiously directed to it. Prompted by benevolence, or urged by the hope of honour or reward, the most eminent physicians of the day had devoted their time and medical skill to the elucidation of its nature, cause, and mode of treatment; and all, not only without success, but, it would almost seem, with an unfortunate result; for the malady continued to spread, although it was not so untractable or murderous.

At length it became evident to the medical men who had fruitlessly laboured to remedy the evil, and to the agriculturist who had suffered so severely by it, that they were contending with the foe at much disadvantage; for they knew not his mode of warfare, nor the source whence he derived his power.

They had not studied—no persons had then studied—the anatomy of domesticated animals, or the influence of the conformation of the parts on the discharge of the various functions, or the nature and cause of the diseases of domesticated animals, and the effects of medicines on cattle in health or disease. At length common sense suggested the propriety of the establishment of veterinary schools; and in 1761 the first European veterinary school was established at Lyons, under the superintendence of the justly celebrated Boargelat.

Partly, perhaps, from natural causes, the disease beginning, as we have hinted, to wear itself out in France, but, to a considerable degree, from the diligence and skill of the professors, the ravages of the epidemic were evidently and quickly restrained; and, although it could never be said to have quite disappeared, either in France, or elsewhere, and is yet occasionally far too fatal, yet its victims are, comparatively speaking, few, and it is deprived of most of its terrors. This altered character and decreased devastation of every subsequent epidemic must be traced mainly to one cause—the preventive or curative measures suggested by veterinarians, and the former, perhaps, much more than the latter.

The beneficial consequences of this new study and profession were so

manifest, that young men flocked to the school at Lyons, not only from every province in France, but from Switzerland, Sardinia, Austria, Prussia, and even Denmark and Sweden. A second school was established four years afterwards at Alfort, and in process of time a third at Toulouse, and the last was appropriated exclusively to the study of the diseases of cattle and sheep.

Other governments followed the laudable example of that of France; and with the establishment of these schools was not only connected a mitigation of these fatal maladies, but of every disease to which cattle and horses were subject. Last of all (strange that it should have been so), awakened to a sense of her interest, England established her veterinary school, and devoted it to the same object as the continental ones—the study of the art of preserving the health of all domesticated animals, and *cattle principally*. Unfortunately, the English Veterinary College was established at St. Pancras, too near to the metropolis; and, like the one at Alfort, in the immediate neighbourhood of Paris, the influence of situation prevailed over the most excellent regulations that could be adopted, and the patients became principally, or almost exclusively, horses. In the French school, indeed, the instruction continued to extend to the treatment of all domesticated animals, although the value and effect of that instruction were much diminished by the want of cases illustrative of it; but in the English school, not only were there no horned patients, but not a lecture was given on the anatomy or diseases of cattle; and the pupils were sent where they would of necessity have the ox and the sheep as their patients, without the slightest knowledge of the maladies of either.

A veterinary school has lately, however, been established in Edinburgh, under the patronage of the Highland Society of Scotland, where everything that it behoves the practitioner to know is taught to the pupil; and, more recently, that excellent and truly liberal institution, the University of London, has admitted a veterinary school under its roof, and, on the same extended plan, embracing every object of the veterinarian's care. The necessary and the beneficial result of this will be, that the diseases of cattle and sheep, hitherto so disgracefully neglected among us, will be better understood, and at no distant period the dreadful annual loss which the country sustains in the death of cattle and sheep, and which has been underrated rather than exaggerated at the commencement of this treatise, will be materially diminished. Why has the Board of Agriculture in England, and the Agricultural Societies of England, so long neglected their duty, while in every continental state the improvement of veterinary science has been an object undeviatingly and successfully pursued? The Highland Society of Scotland is reaping the benefit of its judicious patronage of veterinary science in the increased value of Scottish cattle; and it is to be hoped that the agriculturists of England will not be much longer inattentive to the dictates of interest, reason, and common sense.

Inflammation of the respiratory passages is often confined to particular and to very small portions of them. The posterior part of the mouth, the pharynx, through the funnel-shaped cavity of which the food passes in order to arrive at the gullet, is peculiarly subject to inflammation: it is recognised under the term *sore throat*, and is usually accompanied with cough, and other symptoms of catarrh.

PHARYNGITES—SORE THROAT

The characteristic symptoms are disinclination to food, suspension of rumination, and difficulty in swallowing. Solid food is either dropped from the mouth when partly masticated, or it is forced down by an evidently

painful effort; liquids are generally obstinately refused, or are swallowed by a convulsive kind of gulp. There is tenderness extending from ear to ear, and usually some degree of enlargement in proportion to the inflammation of the neighbouring parts, and especially the parotid glands are involved. Occasionally the irritation of the pharynx produces constriction of its muscles, and a portion of the food, both solid and fluid, is returned through the nostrils. The cough of sore throat is a painful one, and is evidently confined to the throat. It is seldom that this disease is a simple affection in the horse; it is usually combined with catarrh or influenza: it speedily terminates in them; or it is the sympathy of the pharynx with other inflamed parts, and its treatment merges in the treatment of them; except that recourse should be had to local warmth and the application of local stimuli. In cattle it is often a decidedly local affection; there is not the same tendency to take on inflammation in the neighbouring parts produced by ill-usage or mismanagement; the treatment, however, will be the same, viz. bleeding and physic, to abate the general fever, and stimulating embrocations, or even blisters, to subdue the local inflammation.

The great development of the ethmoid and turbinated bones in the nose of the ox, in order to increase the acuteness of smell in that animal, has already been described (vide p. 310): the consequence of this is, that there is but a small passage left for the air; and when the membrane of the nose occasionally sympathizes with that of the pharynx, and becomes inflamed and thickened, there ensues a difficulty of breathing from sore throat which is rarely seen in the horse. It is true that the ox breathes partly through the mouth, but the pharynx itself is constricted and thickened, and the breathing becomes laborious almost to suffocation: therefore sore throat should be considered in a rather more serious light in the ox than in the horse, and be treated with corresponding promptitude.

LARYNGITES—INFLAMMATION OF THE LARYNX.

This is a dreadful disease, and, fortunately, one of rare occurrence. It is inflammation of the lining membrane of the larynx, and is attended by a quickened and loud and laborious breathing that would scarcely be thought credible. In some few exceedingly acute cases the number of respirations equals, or even exceeds, that of the pulse. The least pressure on the neck over the larynx seems to give intense pain. The treatment is here plainly indicated—bleeding, physic, blisters, and, when suffocation actually threatens, trachæotomy.

EPIDEMIC AFFECTION OF THE UPPER AIR-PASSAGES.

In low and marshy districts, and a wet, cold, ungenial spring or autumn, there is occasionally an epidemic inflammation of the pharynx, larynx, and windpipe, which differs in some respects from any of the diseases that have yet been described, and is very fatal. The malady commences like most febrile ones, with loss of appetite and suspension of rumination; to these speedily succeed dulness, some prostration of strength, and a slight difficulty of breathing. On the following day, or in the course of a few hours, the throat becomes tender, and it is evidently a little gorged between the channel, and extending some way down the neck. The animal finds difficulty and pain in moving his head or his neck, and also in swallowing the medicines or drinks which are given to him. The engorgement slowly proceeds, or seems to be stationary for a while; the fever acquires no high degree of intensity, but the languor and prostration of strength increase sometimes there is discharge from the mouth or nose of a purulent cha-

racter, yellowish-white in colour, foetid, tinged with blood, and seeming to contain particles of some mucous membrane which has been corroded, and is coming away piecemeal. The disease frequently terminates in suffocation about the fourth or fifth day.

On examination after death, the pharynx is generally filled with this purulent matter, and the membrane beneath is in a state of ulceration, or gangrene. The inflammatory appearance, and the gangrenous one too, extend to a greater or less distance down the gullet; they usually occupy the whole of the larynx, and often a considerable portion of the windpipe, and occasionally may be traced into the bronchial tubes. It is evidently a local affection; it is acute inflammation of the pharynx or the larynx; oftenest of the former, and sometimes of both. The contents of the thorax and the abdomen have usually been free from disease.

Bleeding has been found of little service in this complaint; the manifest object of the practitioner is, either to hasten the suppuration while the surrounding membrane and other parts retain some vital power, or to evacuate the fluid as quickly as possible. For the first purpose blisters of various kinds, and even the heated iron, have been applied to the throat; for the second, the tumour has been lanced, however deeply it may be seated. It requires, however, an experienced veterinary surgeon to conduct any operation here, for the part is crowded with important blood-vessels, the wounding of one of which may be fatal.

When there is no great external enlargement, and yet much difficulty of breathing exists, and suffocation is threatened, there is reason to apprehend that the pharynx, or some factitious pouch which nature has suddenly formed for the fluid, or (yet very rarely, for they are small in the ox) the guttural pouches, or the commencement of the communication between the mouth and the ear, are filled with pus. None but a veterinary surgeon, and a skilful one too, should attempt an opening in such a case. The following hints may be some guide to the young veterinarian.

PUNCTURING THE PHARYNX.

The beast must be cast, and properly secured. This must be effected with as little violence as possible, for in the struggles of the animal, and the sudden quickening of the breathing, suffocation may ensue in a moment. If there is a little greater enlargement on one side than on the other, the animal should be cast with that side upwards. The operator should now have the head of the patient moderately extended, and then he will ascertain the situation of the middle of the anterior edge of the atlas, or first bone of the neck (*vide n.*, p. 272). Close upon this, or connected with it, he will find the posterior edge of the parotid gland. He should elevate the skin, and, taking the edge of the atlas as a guide, and following its direction, he should make his incision about two, or not exceeding three inches in length, but no deeper than the skin and the cellular substance, and the centre of his incision should answer to the centre of the rounded edge of the atlas. A thin layer, partly muscular and partly fibrous, will now present itself. It belongs to the subcutaneous muscle of the neck, and it lies upon the parotid gland. He should dissect through it carefully, and if his first incision has been a correct one, he will come upon the posterior edge of the parotid gland. This he must separate cautiously from the atlas, and from the cellular tissue by which it is tied down, and elevate, or turn it aside, as far as the middle of the space which separates the atlas from the mastoid process.

The forefinger must now be introduced into the opening. There is first felt a layer of soft parts, and then the superior lateral branch of the hyoid

bone, from the extremity of which a flat muscle—the stylo-hyoideus (fig. 13, p. 332)—goes to the styloid process of the occipital bone. Immediately under this muscle lies that portion of the pharynx which is connected with the Eustachian tube; and now, the back of the instrument being turned towards, or touching the parotid gland, and the edge of it towards the ear, and the head being somewhat more extended in order to change a little the situation of the carotids and nerves, the bistoury is plunged through the muscle into the pharynx beneath.

Sometimes the whole of the fluid cannot be evacuated through this first incision, and a new one must be sought in a more dependent direction. A curved sound must be introduced into the first orifice, and the end of it made to press against different parts of the cavity, until it can be plainly felt externally between the bifurcation of the jugular: every important vessel and nerve will be in this way pushed aside, and the point of the sound may be cut down upon without danger.

BRONCHITIS.

When catarrh begins to spread, and to involve the lower and more important air-passages, it attacks the bronchial tubes oftener than any other portion of the respiratory apparatus. That which would become inflammation of the substance of the lungs in the horse, is a similar affection of the lower and minuter air-passages in cattle. We are unable to assign any satisfactory reason for this, but it is an important pathological fact. It used to be called inflammation of the lungs in cattle, and is so considered by the majority of farmers and cowleeches; but since the improvement of veterinary science, this distinction, and one of some moment, has been established. Bronchitis, however, is seldom pure; it is the prevailing disease, but it is complicated with slighter inflammation of the neighbouring substance of the lungs. Bronchitis is rarely sudden in its attack. It is preceded, and generally for a long time, by cough—cough becoming more and more frequent and painful, and husky and wheezing.

Here, then, is another motive for attention to the hoose of cattle. Catarrh, simply as catarrh, may do little harm; but the inflammatory affection will gradually involve other and more important membranes, inflammation of which is generally fatal. Bronchitis is the intermediate step between catarrh and consumption, and it unfortunately is that step which, if once taken, the other must follow. We may, therefore, except when the disease assumes an epidemic character, (which it not unfrequently does, and particularly in young cattle,) attribute it to the neglect or mismanagement of the herdsman or the owner.

The existence of bronchitis may usually be detected by a gradual change of the countenance; a sunken, anxious, haggard look; a rapid and laborious breathing, attributable, at first glance, to something more than mere catarrh, however severe that may occasionally be; a cough, painful to a very great degree, and against the full action of which the animal strives as much as he is able, so that it is not full and perfect, but *husky* and *wheezing*. There is a very considerable disinclination to move, which is easily accounted for; for inflammation of the bronchial membrane is accompanied by thickening of it, and by the secretion of a quantity of viscid mucus, so that the passages are, to a considerable degree, obstructed. This gives a consciousness of the danger of suffocation, and occasionally the disease terminates in suffocation. The slightest motion aggravates the cough; and motion of a sudden kind sadly oppresses and terrifies the naimal. The breath, passing over so great an extent of inflamed surface, is evidently hot. The seat of inflammation being deep, no pain is indi-

cated when the side of the animal is pressed upon, or lightly struck; and for the same reason the animal does not gaze anxiously at its sides. In addition to this, and most important of all, and marking the fatal progress of the disease, the animal loses flesh rapidly, and to a very great extent; the patient becomes a mere skeleton, and has not been unaptly described as crawling about with merely a dry skin covering a set of creaking bones.

To young cattle bronchitis is particularly destructive, and the symptoms and accompanying circumstances are very singular. A yearling is often observed to have a cough peculiarly distressing. If he is bled, and setoned, and physicked, the symptoms will sometimes rapidly abate, particularly, some think, if the worm-drink of the village doctress is administered; but in most cases remedial measures are applied in vain. The cough continues as distressing as ever. The intermissions are short, and the paroxysms exceedingly violent. The beast is off his feed, hidebound, his belly tucked up, his coat staring, his flank heaving, and it is painful to hear him cough. This occurs principally on low, marshy, woody lands.

The animal at length dies, and the whole of the bronchial passages are found to be completely choked up with worms. They are of the *strongylus* species, and mostly the *filaria*. Many of them are also found in the windpipe; and the mucous membrane both of the windpipe and the bronchial passages presents an appearance of the intensest inflammation.

The generation of these parasitical insects will be best discussed when the worms that infest other passages are described: it will be sufficient to observe, at present, that worms are oftenest found in an injurious quantity in a moist state of the atmosphere, or in moist situations, and especially in those which abundantly produce the vegetables and grasses peculiar to such a locality; and also in young subjects, and in those whose constitution is somewhat enfeebled. All these predisposing causes are present here; but the origin of the worm,—whether the eggs possibly floating in the atmosphere, or contained in the food or the drink of the animal, find their proper and destined nidus in the vitiated secretion of the inflamed mucous membrane of the trachea or bronchi, and are there hatched into life; or the membrane is irritated and inflamed by the presence of these parasites, deposited ere the part was diseased;—these are questions which will be better solved by-and-by*.

* The ravages of bronchitis in cattle are not confined to our country. The author has lately been favoured with an account of the same disease, but with a somewhat different character, as it prevails among and destroys thousands of the cattle of Jamaica every year. It is essentially the bronchitis of Great Britain, modified by difference of climate; and miliary tubercles also usurping the place of the strongyli. It is most prevalent in low marshy situations, but it is frequent and fatal in all the West India islands. Young cattle are peculiarly subject to it; but it attacks beasts of every age. It is so fatal that no means of cure are attempted; but as soon as a beast begins to cough he is slaughtered, if in tolerable condition; or he is got into condition as quickly as possible, and destroyed. Cattle so attacked are called *cough cattle*, and there are droves of them upon every plantation of considerable size, with negroes, whose proper business it is to attend to them, and who change them about among the best pasturage that the plantation will afford.

Upon dissection, the fine delicate membrane lining the windpipe, especially about the end next the fauces, is studded and thickly covered with a semi-organized deposition, to the eye like hydatids, but fixed to the membrane itself, and not hanging down like the grape-bunch; these are of various sizes, resembling herring-roë, or fish-spawn. On being cut into, a substance may be turned out of a gritty calculous description, so firmly connected with the cyst that contains it, as scarcely to be separated. This substance may be traced partially along the canal of the whole tube, and extending to the bronchi, and imbedding itself eventually in the substance of the lungs, where alone it appears to be accompanied by purulent matter, or pus of a yellow thick consistence. It is found in various parts of the lungs; sometimes in their substance, and also adhering to the pleura externally, and to the pleura costalis, where some degree of vascularity is evident. In

Bronchitis, when not attended with all the violent symptoms that characterize the existence of worms in young cattle, should be treated like other inflammatory complaints. Bleeding will, as usual, be the first remedy, and it should be carried to the extent which the pulse will allow; in general, however, the ox will not in this complaint bear the loss of so much blood as in other chest affections. To this should follow physic, and the sedative medicines already recommended, with mashes, &c.

In some cases a favourable termination of the case has been produced; but in the bronchitis with worms there are exceedingly few cases of successful treatment. The farmer is so convinced of the almost uniform fatality of the malady, that he either slaughters the animal at once or suffers him to take his chance. He may, perhaps, apply to some old woman in his own or the neighbouring parish, who has an infallible drink for all the diseases of cattle, but he rarely has recourse to the veterinary surgeon.

Can nothing then be done? Is there no drug that can be brought to bear upon these worms? None directly; for not only no fluid destructive to the worms, no fluid of a poisonous nature, can be introduced into the trachea and bronchi, but no fluid at all can pass into these tubes. Can any gas, then, of a deleterious character be breathed, not in sufficient quantity to injure the beast, and yet with a chance of destroying the vermin? Diluted chlorine gas might be inhaled. It might be breathed more readily, and would not be arrested by the watchful sentinels in the nasal cavities and the larynx, if an artificial opening were made into the larynx. Other symptoms of bronchitis, and particularly the feeling of suffocation, might also be relieved or removed by this.

The animal would, probably, be much annoyed by such inhalation; he might cough for awhile with even greater violence; but the worms dying, or their hold being loosened, they might be expelled through the natural or artificial opening by the very urgency of the cough. That veterinary surgeon or agriculturist would deserve well of his country who puts this fairly to the test.

There is another mode of going to work, and one that promises occasional success. There are certain drugs that are taken up by the lacteals, or by some of the absorbent vessels, and carried into the circulation, and produce their effect by immediate contact with the part on which they operate. Thus mercury acts in various local diseases; iodine lessens the growth of many tumours; and turpentine is a diuretic. Turpentine is peculiarly destructive to worms. It most effectually expels the tape-worm from the human being; and it often produces the expulsion of vast quantities of the round worm from the horse. It also enters into every part of the circulation: it is recognisable in the urine and in the breath. Can it, through the medium of the circulation, be brought into contact with these worms? It is worth the trial.

Are there no medicines that promote expectoration in cattle, *i. e.* which loosen the morbidly viscid mucus secreted in these tubes, and cause it to be more easily discharged in the act of coughing? There is no doubt

traversing the windpipe small worms are frequently discovered, like the end of a thread, and of the shape of ascarides; but whether they are the effect of accident, or connected with the disease, does not clearly appear, for very few are found, and they are not always present. Tubercles containing the same gritty substance are found in various parts of the liver.

In some cases this morbid appearance is not found in the upper part of the windpipe, nor are there any signs of its having existed there; but about the bifurcation of that tube, and the commencement of the bronchi. Many flukes are often found in the liver.—

Private Letter.

that certain drugs effect this purpose in the human being ; the exhalents of the bronchi, under their influence, pour out an increased quantity of mucus, far less adhesive in its nature, and expelled with little difficulty. Some practitioners are so much in the habit of mingling numerous drugs in the same ball, or drink, that they cannot be assured of the precise effect of each ; and others, from an equally erroneous habit of contracting their pharmacopœia, and shunning almost every drug in which the human practitioner places confidence, have made few well-conducted experiments on the power of different medicines even on the horse, and none on those which are administered to cattle. The turpentine should take the precedence in any trial that may be made to expel the strongyli from the bronchi ; and, that failing, it might be worth while to experiment on the effect of squills, or the gum benzoin, or the balsams of Peru and Tolu.

INFLAMMATION OF THE LUNGS.

The beautiful appearance of the *lights* or lungs in cattle, compared with those of the horse, will sufficiently prove that these animals are comparatively seldom subject to pure inflammation of the lungs. It has been acknowledged, however, that, to a certain extent, it accompanies bronchitis ; for, when the membrane of the air-passages is inflamed, it is to be expected that the air-cells in which these passages terminate will not quite escape.

The substance of the lungs is made up of thousands of these little cells or pouches, into which, as has been already stated, the air is at length conducted ; and over the delicate membranes constituting the divisions of which, myriads of minute vessels are ramifying, and where the blood undergoes its important change. It is easy to imagine that this membrane, so delicate and so loaded with blood-vessels, must be subject to inflammation, and that of an exceedingly dangerous character.

Still, however, these air-cells are not so often the seat of inflammation in cattle as might on first consideration be imagined. There are exciting causes enough of inflammation in the air-passages from exposure to the inclemency of the weather, and from the general bad management to which cattle are subject ; and this may run on to the formation of tubercles and ulcers, and death : but there is not the irregularity of exercise—the sudden and exorbitant demand for arterialized blood—the rushing of the blood through these minute vessels—the distention, the labour, the rupture of them, and their consequent disposition to inflammation. They are different parts of the lungs which are exposed to danger in the two species of animals ; and this sufficiently accounts for the different character of disease.

Until lately all chest affections were confounded under the term pneumonia, or inflammation of the lungs ; and there is no reason for pushing our distinctions too far, except that it is satisfactory to know the precise nature of the disease which destroys our cattle, for that will probably lead us to the discovery of the actual cause of the malady, different as we see here in bronchitis and pneumonia. It may also lead to minute, yet important differences in the treatment of disease, as we shall have to point out in the present case.

Pneumonia occasionally attacks all cattle, but more particularly working beasts, and those that have been driven a long way, or that have been unnecessarily hurried on a journey of a considerable length. The disease usually appears at the distance of some hours, or a day or two, from the exciting cause of it, and can generally be clearly traced to that cause. In the catching weather of harvest, in the haste to get the manure on the

ground when a sharp hoar-frost suddenly appears and that does not seem likely to last long, and in the hurrying from fair to fair when the markets follow each other closely in distant parts of the district—we trace evident causes of pneumonia. The beast is dull—the head is extended or drooping—grazing and rumination have ceased. The flanks heave, but not so laboriously as in bronchitis. There is cough, frequent—sore, but not so frequent, nor so urgent, nor so painful as that of bronchitis. The mouth is hot, but the horns and ears and feet are cold—deathly cold. The animal will not lie down—he will scarcely move, but more from inability to move because he wants the use of the muscles for other purposes, than from fear of suffocation—and he plainly and anxiously points out the seat of disease by looking at one or both flanks. Pneumonia, then, would be easily distinguished from the disease which has been just treated of, and from pleurisy, which will next come under consideration, if the symptoms of the maladies of cattle were but a little more attended to than they generally are.

The treatment will vary in some minute particulars. Bleeding will be indicated, and as early as possible, and, pursuing the old rule, the blood should flow until the pulse is affected. A much greater quantity will be abstracted in this disease than in bronchitis, because the animal will bear up, or struggle with the loss of blood. In a membrane so vascular as that which lines the air-cells, the inflammation will often be so intense that it will not yield to one bleeding, and the progress of the disease must therefore be watched with this view.

Physic will be as plainly indicated as in bronchitis; and in despite of a very proper fear about its being carried too far in the horse, and producing a more untractable disease in the abdominal cavity, physic may be given to cattle in pneumonia, generally with advantage, and always without apprehension. It should, however, be of an unirritating kind. The purgative effect should be first produced by the Epsom salts, and kept up by sulphur. In an acute inflammation, like that of the lungs, it is necessary that the physic should act speedily, and yet it may amazingly accumulate in the rumen. The practitioner hardly dare to unite with it much aromatic or stimulating matter in order to rouse this comparatively insensible viscus to action, but he must have speedy recourse to the stomach-pump in the way already pointed out.

Blisters will here be especially indicated. The inflammation is no longer that of the air-passages deep in the substance of the lungs, but of their terminations, upon the surface of the lungs, as well as everywhere else. It is difficult to cause a blister to rise on the thick skin of the ox: yet the common blister-ointment, thoroughly rubbed in, will occasionally have effect. The turpentine tincture of cantharides, repeatedly applied, will cause considerable swelling; or, both of these failing, there remain, in bad cases, boiling water and the hot iron at the command of the surgeon. Setons in the dewlaps should never be omitted.

The same attention to diet is requisite as in other acute inflammations of the chest.

ACUTE AND EPIDEMIC PNEUMONIA.

An acute species of pneumonia in cattle is sometimes met with, and it occasionally appears as an epidemic. The beast hangs his head—there is dryness of the muzzle—the mouth and breath are hot—the flanks more or less agitated—there is a hard, dry, and frequent cough—the appetite is gone, but the thirst is excessive—the excrement is solid and black, or liquid, black, and fetid—the coat rough—the horns and ears hot, or alter-

nately hot and cold—there is languor and apparent weakness, and sometimes direct lameness, and most frequently of one of the hind legs

To these rapidly succeed other symptoms—that tenderness along the spine and the whole of the lumbar region which has been again and again described as so characteristic of almost every inflammatory disease of cattle: the head is now stretched out—the eyes are unnaturally bright, yet weeping—there is grinding of the teeth—the mouth and breath become hotter—a mucous, or sometimes purulent discharge runs from the mouth and nostrils, at first clear, but soon becoming brown, red, or bloody—the flanks heave more violently—the cough is more urgent—it has become convulsive—the nostrils dilate and contract with spasmodic violence—the animal no longer lies down, or if he does, rises again immediately—sweats break out on different parts of the body—the temperature of different parts varies, and very curiously changes—the secretion of milk is suspended, but the teats become hard and swelled—tumours appear on various parts—a shivering, partial or total, succeeds, and the tumours disappear, but they speedily rise again and are more permanent. Possibly some of the most urgent of the symptoms remit when the tumours begin to appear, but towards night an exacerbation succeeds, which does not subside until the morning.

The prostration of strength increases—the belly is tucked up and corded—the flanks heave with greater violence—the back and loins become bowed—the limbs are drawn together towards the centre of gravity—the stools are liquid and fetid, and accompanied by much straining and tenesmus—the sensibility of the loins is now subsided—the sensibility generally is almost gone—the flies collect about the beast, and he makes no effort to drive them away—every irritant ceases to act upon the skin—the respiration is quickened, and more and more laborious—it is accompanied by a gurgling noise in the chest, distinctly heard even without the application of the ear to the side—the nostrils become yet more dilated, and the mucus flowing from them varies in colour, but exhales a cadaverous, infectious odour—the breath is now become cold, and is as offensive as the discharge—the pupil of the eye becomes dilated—an offensive secretion proceeds from the lids, and the animal is evidently becoming blind—the prostration of strength still goes on—the beast falls—he perhaps rises again for a little while—and then falls and dies.

The disease is sometimes rapid in its progress, and the animal is destroyed in twenty-four or eight-and-forty hours after the first attack. This is particularly the case with young cattle, and those that are in good condition. At other times, the beast lingers on six or seven days.

On examination after death, the lungs are gorged and black with blood; they are softened, and easily torn; they, however, contain some spots of hepatization, or condensed substance, and often abscesses filled with pus. In many parts gangrene has begun, and chiefly about the anterior portion of the lung. The pleura, the pericardium, and the diaphragm are black, thickened, and disposed to gangrene. Traces of inflammation are found in the abdomen, but not of so intense a character. The rumen is filled with dry food; the contents of the manyplus are so hardened that they may be broken and reduced to powder; the fourth stomach is more or less inflamed; the liver is enlarged, and of a yellow colour, and the bile is thickened.

It is evidently inflammation of the lungs, associated, more or less, with that typhoid form of disease to which cattle are so subject. Solitary cases of it are seen; but it often appears as a kind of epidemic. It used to be called *gangrenous* inflammation of the lungs, from the supposed gan-

greenish state in which the lungs were found; but veterinary surgeons are now aware that these appearances are produced more by congestion; and indicate the violence with which the blood has been driven through the vessels of the air-cells, and by which those vessels have been ruptured, and the cells filled with blood. The blood, once effused, soon coagulates in the cells, and gives that black, softened, pulpy kind of appearance which the cowleech and the herdsman used to think was proof positive of *rottenness*. It is true that this effused blood soon begins to be decomposed, and the foetid smell of corruption ensues; but this is very different from gangrene of a living part. These congested lungs show that the inflammation was of the intensest character, and had not been long in destroying the animal.

Foreign writers give several accounts of this disease raging as an epizootic, and destroying a considerable proportion of the cattle. The history given by the poet Silius Italicus of an epidemic which raged in Sicily two hundred and twelve years before the Christian era paints the disease of modern times with almost perfect accuracy. It followed a long-continued and excessive drought, which corrupted the water everywhere. In 1693 the principality of Hesse lost the greater part of its cattle by a malignant inflammation of the lungs. Here the winter had been wet and cold, and the spring which succeeded was as hot as summer. It was also said that an acrid and corrosive dew fell which tinged the linen with a yellow hue.

These writers imagined that the disease was not only epidemic, but contagious. They affirm that an epizootic pneumonia, which ravaged the department of Loiret, was brought into the environs of Montargis by some cattle that had been sold by the drovers; that it rapidly spread in all the villages in which the infected cattle had been purchased, and that its communication from place to place could easily be traced.

Professor Abildgaard, of Copenhagen, speaks of a species of pneumonia which he considers to be contagious, and which spread through the establishment of the King of Denmark. The contagious character of the disease, however, is far from being established. No other variety of pneumonia with which we are acquainted is contagious, at least under ordinary circumstances; yet the accounts that have been given of it are so contradictory, and veterinary science, as it regards cattle, is so truly in its infancy, that the farmer should take the most prudent course, and avoid, as much as he can, the possibility of contagion.

Few years pass in which this acute pneumonia does not visit some districts of the United Kingdom. The symptoms vary, but it is decidedly a disease of the respiratory system primarily, and the danger depends on the intensity of the inflammatory action in the early stage, and the degree in which the vital power being exhausted, disease of a typhoid and malignant character succeeds.

Of the nature of the treatment there can be no rational doubt. Although the state of acute fever is quickly succeeded by one of a perfectly contrary character, it is not until it has committed the most fearful ravages. The congested state of the lungs—the breaking down of the substance of that important part—must be sufficient to convince any rational person of the mischief that is going forward in the early stage, and the necessity of disarming the enemy before that mischief is irreparably inflicted. Therefore this acute pneumonia should be attacked in time, and by the most energetic treatment. Bleeding is the sheet-anchor, and should be pushed to its full extent. The important fact that the pulse, duly attended to, will prevent the possibility of injurious consequences from

bleeding in every case cannot be too often alluded to. While the pulse keeps up, the power of the constitution, or rather the power of the disease, is unimpaired; and the faltering of pulse gives timely warning that one or the other is preparing to give way. It is folly to object that the after weakness will be increased, or that the bleeding will undermine the power of the constitution: it is the disease which is doing this, and which will perfectly and fatally accomplish its work if unchecked. By weakening the power of the disease, and especially if it could be beaten out of the field, the vigour of the system would be preserved, and the animal would be saved. In proportion to the intensity and rapid progress of the inflammation should be the vigour of the attack.

The state of the cough, and heat of the breath, and heaving of the flanks, will indicate, in the space of a few hours, whether the fever is permanently diminished, or has again rallied its forces; and by this the practitioner will be guided as to the propriety of a second bleeding, and the quantity of blood to be taken away.

Physic will of course succeed. Two scruples of the farina of the croton nut should first be given, as most likely to operate speedily; and the Epsom salts and the injection-pump should be in requisition until the bowels are well opened.

This being accomplished, the nature of the medicines next to be administered may well give the practitioner pause. If the inflammation evidently continues, the digitalis, emetic tartar, and nitre will be given. If the fever is, to a very considerable degree, subdued, but it is far from certain whether there may not be lurking danger of its return, the sedative medicines must still be given, but half an ounce of the spirit of nitrous ether should be added. This is an excellent medicine in such cases. It is both a sedative and a tonic. It allays irritation, and it stimulates to healthy action. Its good effect, however, is often destroyed by its being given in outrageous doses. In these doubtful cases it will rarely be prudent to give more than half an ounce; and when designed as a stimulant, the dose should rarely or never exceed double that quantity.

If the stage of debility is evidently and rapidly approaching, the chance of doing good is almost gone. What power will restore the former healthy state of the lung? Yet there is no cause for absolute despair. The mouth and nostrils and any suppurating tumours must be washed with the chloride of lime. A small quantity—half a drachm of the powder in solution—should be given internally, morning and night. The spirit of nitrous ether and laudanum, in doses not exceeding an ounce of the former with half an ounce of the latter, should be administered; and to them may be added ginger, gentian, and colombo, the whole being given in thick gruel, with half a pint of good ale.

Malt mashes, vetches, carrots, clover, hay—according to the season—may be offered as food, and, should the situation and time of the year permit it, the animal should be turned into a salt-marsh as soon as it has strength to travel there.

The epidemic nature of the malady not admitting of any doubt, and its contagious character being yet a question of dispute, while the healthy beasts are separated from the diseased, the owner cannot too often visit, nor too closely examine his cattle, in order to detect the earliest symptom of the disease, and to attack it while there is fair hope of success.

The sound animals, every one of them, should be bled and physicked. This inflammation is most intense in its character, and strong and healthy beasts in good condition fare the worst; then care should be taken to remove a plethoric state of the system, and thus to remove the predis-

position to disease. They should likewise be turned, if possible, into a pasture good and containing sufficient nourishment, but not quite so luxuriant as that on which they had probably been placed.

PLEURISY.

While disease of the substance of the lungs usually takes on the form of bronchitis in cattle, these animals are nevertheless, and much oftener than the horse, subject to inflammation of the pleuræ, or covering membrane of the lung, and the lining one of the chest. Some—although, perhaps, not quite satisfactory—reasons may be assigned for this. The exemption of the ox from many of the exciting causes of pneumonia in the horse has already been hinted at, and to this may be added many of the exciting causes of pleurisy also. Among these, and the most frequent and active of them, is the exposure to partial cold. A horse may be hardly worked and ill used, but he generally has something which bears the semblance of a stable or a hovel to shelter him at night; but the ox, after hard work, and the cow, too soon after parturition, have nothing but the cold damp ground to lie upon. If the horse is thoughtlessly and cruelly abandoned in the same manner, yet the food passes out of his little stomach almost as fast as he gathers it, and he wanders about grazing during the greater part or the whole of the night; but the paunch of the ox is filled before a third part of the night has passed, and then comes the slower process of rumination, during which he usually lays himself down. What can afford so prolific a cause of pleurisy? If the horse can scarcely be ridden against a keen wind, or immersed, although but for a little while, as high as his chest in cold water, without exhibiting symptoms, more or less intense, of pleurisy, what will become of the ox, whose side, during the greater part of the night, is in contact with the frozen ground?

Even in his stable the ox is too much neglected. In many ill-managed farms his shed is little more than a repository for dung, which there undergoes its first fermentation. A little fresh litter is occasionally strewed over it; but underneath is a damp and poisonous mass, where the process of evaporation and the diffusion of pestilential gas are in great and almost equal activity. Supposing a beast to be couching on this fomes of disease during the greater part of the night,—what can be more likely to cause inflammation of the lining membrane of the chest, separated from the muck-heap by so small a distance?

Pleurisy may be produced by contusions on the side, and by wounds penetrating the thoracic cavity: to these evils the ox, among his horned brethren, is far more exposed than the horse.

Whatever be the cause, post-mortem examination proves that, next to bronchitis, the most frequent disease of the chest is pleurisy.

Among the symptoms by which we may distinguish pleurisy from every other inflammatory affection of the chest, is the greater frequency of universal shivering, and particularly of shivering or trembling of the shoulders. This is a very peculiar symptom, and should be carefully studied. Even while the animal is otherwise quiet, the shoulders and upper part of the chest are trembling violently.

The cough of pleurisy is lower, shorter, and more painful than that of most other chest affections. The breathing, seldom so laborious as in some other cases, is shorter and broken off in the act of inspiration, and lengthened in that of expiration. The sides are tender; the animal shrinks if they are but lightly touched; and there are twitchings of the skin, and

a very curious succession of wavy lines running over the affected side or sides.

The author recollects one case in which these symptoms of pleurisy were said to be absent—they certainly were absent when he saw the patient. It was a cow that, during nearly two months, had been wasting. The emaciation had proceeded to a most unusual degree; the skin clung to the very bones, the flanks were tucked up, and the hair was coming off. She ate and ruminated as usual, and the only disease that could be connected with this loss of flesh was obstinate constipation.

Plenty of purgative medicine was given, but she continued to waste away, and died. There was no disease of any of the viscera of the abdomen, and the only unusual appearance was the almost total absence of internal fat, the diminution, or almost disappearance, of the mesenteric glands, and a constricted state of the small intestines; but the chest was full of stinking puriform fluid, and there were adhesions in various directions. The real disease was pleurisy. The proprietor and the herdsman were very closely questioned with regard to previous cough and other symptoms of this disease; but they had not heard her hoarse at all—they were sure that she had not.

She must have had cough and other characteristic symptoms of pleurisy, but to so slight a degree as not to attract the attention of those who look over their cattle so carelessly as both farmers and their servants generally do. It is, however, an instructive case, showing how much mischief may be going forward when it is least suspected, and of what imperative necessity an attention to the hoarse of cattle is.

In bronchitis the animal dies of suffocation, or he is worn out by a continuance of inflammation on so extensive a membrane:—in pneumonia there is usually congestion of the lungs, so that the blood can no longer circulate, or there are tubercles or vomicae, or the animal sinks here likewise under the continuance of the inflammation; but the termination of pleurisy is by the effusion of fluid into the chest, compressing the lungs on every side, gradually rendering respiration difficult, and at length impossible, and destroying the beast here likewise by suffocation.

There is little difference in the treatment of pneumonia and pleurisy. In both the inflammation must be subdued by bleeding, physic, sedatives, blisters, setons, and restricted diet. Half an ounce of the common liquid turpentine may be used with advantage, instead of the nitre, when the presence of pleurisy is clearly ascertained.

No advantage has been taken of an operation on the pleuritic ox by which the fluid might be withdrawn from the chest, as in the horse. It may be worth the attempt; yet, when the few cases in which the puncturing of the chest has succeeded in the horse are considered, there would not be room for any sanguine hope of success if it were practised on the ox.

Besides this, there are generally adhesions between the covering of the lung and the lining of the sides; and between the lung and the diaphragm, which would always interfere materially with the act of respiration and the health of the animal.

In all these cases of chest affection there is so little prospect of saving the beast, that it would be the interest of the owner to have him slaughtered at the beginning, if he is at all in condition, or rather if he is not deplorably thin.

CHRONIC PLEURISY.

'There is so instructive an account of a chronic species of pleurisy, or of mingled pneumonia and pleurisy, in 'The Recueil de Médecine Vétérinaire,' for May, in the present year (1833), that the author is tempted to give it at considerable length. It is written by M. Lecoq, one of the teachers of the veterinary school of Lyons. There is considerable resemblance between it and the account which has been given of common pleurisy, but the reader will readily mark the difference, which is between an acute and a chronic disease.

He is speaking of Soire-le-Chateau, in the arrondissement of Avesnes, in which the farmers fatten more cattle than they breed, and therefore are obliged to purchase out of the neighbouring districts, and principally from Franche Comté. He says that 'the cattle of that country are very handsome, of a compact form, and fatten rapidly; and that they are the kind of cattle from which the grazier would derive most advantage, were it not for some diseases to which they are subject. The malady by which they are most frequently attacked, and which is particularly prevalent in some years, is one that is generably incurable, and the slaughter of the animal before he has perceptibly wasted is the only means by which the farmer can avoid losing the whole value of the beast: this is *chronic pleura-pneumonia*—chronic pleurisy combined with pneumonia.

'The symptoms are scarcely recognisable at first, and often the beast is ill a long time without its being perceived. He fattens well, and when he is slaughtered the owner is astonished to find scarcely half of the lung capable of discharging the function of respiration. When, however, the ox has not sufficient strength of constitution to resist the ravages of disease, the first symptom that is observed is diminution, or irregularity, of appetite. Soon afterwards a frequent and dry cough is heard, which becomes feeble and painful as the disease proceeds. 'The dorso-lumbar portion of the spine grows tender, the animal flinches when the part is pressed upon, and utters a peculiar groan or grunt which the graziers regard as a decisive symptom of the malady.

'Quickly after this the movements of the flanks become irregular and accelerated, and the act of respiration is accompanied by a kind of balancing motion of the whole body. The sides of the chest become as tender as the loins, or more so, for the animal immediately throws himself down, if pressed upon with any force. The elbows in many subjects become more and more separated from the sides of the chest. The pulse is smaller than natural, and not considerably increased. The muzzle is hot and dry alternately; the animal lies down as in a healthy state, but rumination is partially or entirely suspended. The fæces are harder than they should be; the urine is of its natural colour and quantity; the mouth is often dry, and the horns and the ears retain their natural temperature.

'This first stage of the disease sometimes continues during a month, or more, and then, if the animal is to recover, or at least apparently so, the symptoms gradually disappear. First of all, the appetite returns, and the beast begins to acquire a little flesh. The proprietor should then make haste and get rid of him, for it is very rare that the malady, however it may be palliated for awhile, does not reappear with greater intensity than before.

'In most cases the disease continues to pursue its course towards its fatal termination without any remission—every symptom gradually increasing in intensity. The respiration becomes more painful; the head is more extended; the eyes are brilliant; every expiration is accompanied by

a grunt, and by a kind of puckering of the angles of the lips; the cough becomes smaller, more suppressed, and yet more painful; the tongue protrudes from the mouth, and a frothy mucus is abundantly discharged; the breath becomes offensive; a purulent fluid of a bloody colour escapes from the nostrils; diarrhœa, profuse and fœtid, succeeds to the constipation; the animal becomes rapidly weaker; he is a complete skeleton, and at length he dies.

‘Examination after death discovers slight traces of inflammation in the intestines, discoloration of the liver, and a hard and dry substance contained in the manyplus. The lungs adhere to the sides and to the diaphragm by numerous bands, evidently old and very firm. The substance of the lungs often presents a reddish-grey hepatization throughout almost its whole extent. At other times there are tubercles in every state of hardness, and in that of suppuration. The portion of the lung that is not hepatized is red, and gorged with blood. Beside the old adhesions, there are numerous ones of recent date. The pleura is not much reddened, but by its thickness in some points, its adhesions in others, and the effusion of a serous fluid, it proves how much and how long it has participated in the inflammatory action. The trachea and the bronchi are slightly red, and the right side of the heart is gorged with blood.’

M. Lecoq hazards some conjectures respecting the cause of this disease, which are very ingenious, and from which our breeders and graziers may derive some useful hints. He says that ‘the graziers imagine that the animals bring the disease with them from their native country; and the traces of chronic disease which are found in them, even when they are slaughtered soon after their arrival, singularly confirm this opinion. Cattle that have been worked hard, and driven far, and somewhat too rapidly, are often attacked by diseases of the chest, which generally leave some dangerous traces behind them; and besides this, the breeders know their interest sufficiently well to get rid of those animals as soon as they can that have been affected with chest complaints.

‘The manner in which the journey is performed contributes much to revive the old disorder. The cattle purchased in Franche Comté are brought into Avesnes at two periods of the year—in the autumn and in the spring. Those which are brought in the autumn are more subject to the disease than those which arrive in the spring; and, almost always, the years in which the malady is most prevalent are those in which the weather was bad during the journey of the beasts; and the disease is usually fatal in proportion to the badness of the weather.

‘The journey, also, is performed by two different routes—through Lorraine and Champagne, and often the disease appears only in the cattle that have arrived by one of these routes.

‘The manner in which the cattle are treated on their arrival may contribute not a little to the development of the disease. They have, perhaps, been driven a hundred leagues during bad weather; they have been half-starved on their journey, and they arrive famished and worn out, and, in fact, the greater part of them are lame. Calculating on their ravenous appetite, the graziers, instead of giving them wholesome food, make them consume the worst that the farm contains—all that is musty and mouldy; and it is often by the cough which the act of eating of such food necessarily produces, that the malady is first discovered.’

The treatment of chronic pleurisy is the most unsatisfactory part of this excellent memoir. He orders mild and nourishing food; for he argues that by increasing the debility of the animal, his death will be hastened. He recommends green meat, in order to soften the strangely-hardened

contents of the manyplus, and mucilaginous drinks (made of oatmeal or linseed) for the same purpose. Whey is often given with the same view, and on account of the nutriment which it contains. Bleeding is rarely employed; or if the pulse should indicate venesection, very little blood is abstracted at a time, but the small bleedings are occasionally repeated. The principal dependence is placed on setons and rowels, which, if used at all, are carried to a great extent: but before these are resorted to, the proprietor is requested to determine whether he is disposed to persist in the medical treatment of the animal; for this mode of treatment having been once commenced, the swellings and discolourations produced by the setons and rowels will prevent the butcher from afterwards purchasing these animals. Injections, friction, and warmth are the auxiliary means employed.

However skilful may be the treatment, or however steadily pursued, it is rarely that a beast is saved; and that is not surprising, considering the numerous adhesions which were formed between the lungs and the sides of the chest before the animal began to exhibit any symptoms of illness. M. Lecoq adds, that it is good, although unpleasant, advice to give—it is what has been many a time inculcated in this treatise—that it is always preferable to send the diseased or suspected animal to the butcher before the process of emaciation is established in good earnest: a part of the original price of the beast is then recovered, and the expense of medical treatment, always long, and generally unsuccessful, is saved. M. Lecoq candidly confesses, that of thirty beasts of which he had the care, two only were apparently cured, and got into condition, and one of them died suddenly a few days after he was sold.

M. Lecoq finally enters into the question of the contagiousness of this disease. The farmers believe it to be contagious, and he is partly of their opinion. When a beast falls sick in the pasture, the others, after his removal, go and smell at the grass where he has lain, and which he has covered with his saliva; and after that, M. Lecoq has always seen new cases succeed to the first. He has also seen three cases in which the cattle of the country, perfectly well before, have fallen ill, and died with the same symptoms, except that they were more acute after they have been kept with pleuritic cattle. He, therefore, regards this affection as contagious; or at least, he imagines that, in the progress of the disease, the breath infects the air of a cowhouse in which there were other animals already predisposed to this, or similar, maladies. On the other hand, he acknowledges that many cases usually appear at the same time, and in cattle that have been widely separated from each other.

M. Lecoq has very clearly stated the chief causes of this disease, in addition to which it has clearly an epidemic character. There are certain states of the atmosphere which call into action these lurking predispositions to disease, found most in the stranger cattle, but sometimes in the natives (for bad management, and hoose, and pleurisy exist too much everywhere), but there is not yet sufficient evidence of the contagious nature of all these affections of the respiratory organs. He, however, can never err who has recourse to the careful use of every precautionary measure.

PHTHISIS, OR CONSUMPTION.

This is only a continuation of the same subject, or, rather, it is a description of another termination of chronic disease of the lungs. One of the consequences of continued inflammation of the lungs is the formation of tubercles. There is a greater or smaller number of little distinct cysts, or cells, into which some fluid is poured in the progress of inflammation.

These enlarge, and occupy a space varying from the size of a pin's head to that of a large egg. By degrees the fluid changes to a solid, and the tumour becomes harder than the surrounding substance, and so continues for awhile—the consequence of inflammation, and the source of new irritation and disease.

At length it once more changes. The tubercle begins to soften at its centre, something like suppuration goes on there, and the contents of the swelling become perfectly fluid, but of a different nature from that which first filled the cyst. It is now pus. The cyst increases with greater or less rapidity; it comes in contact with neighbouring ones, and the walls of each are absorbed by their mutual pressure. They run together and form one cyst, which is called an abscess, or vomica.

An animal possessing this tuberculated state of the lungs, and the tubercles running into abscesses, is said to be consumptive. So much of the lung is destroyed, that there is not enough left for the purposes of life, and the patient wastes away, and dies.

The lungs of the cow after chronic or neglected catarrh, or bronchitis, or pneumonia, or pleurisy, are much disposed to assume this tuberculated and ulcerated state. The symptoms of consumption are not always to be distinguished from those of pleurisy, or even pneumonia or bronchitis; and sometimes there may be extensive ulceration of the lungs without any indication of disease sufficient to attract notice. When a bullock is fattened for the butcher, and killed, we occasionally wonder to observe how little of the lung is left for the purpose of breathing.

A cough is the earliest symptom, but a cough of a peculiar character. It is too common to say carelessly, and sometimes cruelly, of a human being, 'that person has a churchyard cough.' The prediction is too often verified: for although it would be difficult to describe that cough, there is a character of its own about it which cannot be mistaken. It is so with regard to cattle. That veterinary surgeon is ignorant of his profession, who does not at once, and at a distance, recognise the cough which, although it may not precisely indicate phthisis, betrays a state of the lungs pregnant with danger. How many a beast might the farmer save if he would be attentive to this!

A bullock hooses:—if the cough is sonorous and clear, the lung is not yet fatally injured. That cough, however, must not be neglected long. It tells of inflammation—it is the product of inflammation—and of inflammation that may be silently, but rapidly, disorganizing the lungs. The prudent man will not suffer such a cough to continue many days, without giving a mash, or a dose of physic; or, perchance, bleeding, and inserting a seton. This is one of the points to which we cannot too often recur. It is new practice—it is new doctrine; but the interests of the agriculturist are peculiarly connected with it.

But, by and by, this cough becomes altered. It is no longer loud, and clear, and careless; it is lower in its tone—feeble—hoarse. Mischiefs have now been done, and perhaps of an irreparable kind. It must not, perhaps, be said that the farmer will always be able to point out the precise nature of the affection of the chest from the sound of the cough; but he will soon learn to do it much oftener, and much more certainly, than he has hitherto thought it possible. In simple catarrh there is an honest and unchecked effort of the lungs to force on the cough; yet some hoarseness may attend that cough, plainly referable to the superior air-passages. In bronchitis there will also be a forcible effort; the mucus is viscid; and the membrane of the tubes is thickened; and the passage is diminished; and considerable force must be used to urge on a volume of air, and to carry the mucus

before it; but it is a force which acts slowly, and by pressure, for the membrane being inflamed is tender. The cough bespeaks pain; it is no longer full and perfect, it is slowly performed, and at the same time husky and wheezing, and the mucus rattles in the passages as it is forced along. In pneumonia the cough is frequent—sore; but it is not so sore as in bronchitis, for it has not the same inflamed membrane to pass over; it is, however, painful, for the substance of the lung is inflamed, and therefore it is low, and, to a certain degree, suppressed. In pleurisy the cough is sharper, spasmodic, yet not loud. Hitherto the pain has been confined to the lungs; here the lining membrane of the chest is affected, and intense pain is felt at every rising and falling of the chest; therefore the cough is short—it is *cut short*—it is somewhat spasmodic, and yet no louder than can be helped.

All this, it is confessed, is new doctrine, and may be considered as bordering too nearly on the regions of fancy by him who, never having attended to these things, knows nothing about them; but let him begin to attend to them, and the writer will venture to promise him that, although puzzled at first, his progress in the art of distinguishing sounds will be most rapid; and he will at length begin to wonder that he could have lived so long among his cattle, and have been so deaf to that which is become too plain to be for a moment misunderstood.

The cough of incipient phthisis is an inward, feeble, painful, hoarse, rattling, gurgling one. The farmer will have reason to tremble when he recognises it, because it reveals fearful disorganization, which can seldom be repaired. He needs not, however, quite despair. The lungs of the cow have not been so sadly used as those of the horse. She is not hurried beyond her will or her strength at the caprice or cruelty of her owner. The progress of the mischief is not unnecessarily accelerated, nor is the process of disorganization rapid. Weeks and months, or, under favourable circumstances, years, may pass on, and few other symptoms be added to this peculiar cough.

There is one duty, however, which the farmer owes to himself, and the practitioner to him by whom he is employed, and that is, to take a fair view of the whole of the case. Here is disorganization of the lungs—that cough which, once understood, can never deceive, has plainly revealed it. It is disorganization which may, in a few cases, be repaired; but in the great, the decided majority of them, will proceed to its fatal termination. At the same time, it is a disorganization which does not immediately interfere with the discharge of the functions of life. The beast will fatten, and, perhaps, almost as rapidly as before. In some cases it has been imagined that, by careful feeding, a very considerable degree of condition has been acquired with unusual quickness; but this will not, cannot, last long. The effect of diseased structure, and diminished substance of the lungs, will soon tell in the unthriftiness and loss of condition of the beast. Except, therefore, peculiar value is attached to the animal, will it be prudent to attempt any medical treatment at all, or at least beyond that of a mere palliative nature?

If anything is to be done, bleeding will be here, as in other inflammatory cases, the first step, but pursued in a more cautious manner than in any of the others—never pushed beyond the very first indication of its proper effect, nor repeated until after due consideration, and a full conviction that renewed irritation is beginning to be set up. To this must be added mild doses of physic, and the use of the sedative medicines; with proper care that the animal is not unnecessarily exposed to the vicissitudes of the weather, and yet avoiding too much nursing

Another view may be taken of the case. Induced by some peculiar value which is placed on the breed, or by some circumstances which have, in the owner's estimation, a favourable appearance, or, somewhat too often, by the unjustifiable representations and promises of the practitioner, the medical treatment of a phthisicky beast is attempted in good earnest.

The attempt appears to be successful; the animal rallies, the cough diminishes, the flanks become quiet, the appetite returns, the milk is yielded more abundantly, the general condition of the beast seems to improve, and both owner and practitioner begin to fancy that danger has ceased. There is too much reason, however, for caution and fear.

There is one circumstance, and one only, which will enable them to understand the real ground on which they stand, and that is, *the character of the cough*, which will still remain, although much less frequent. Is it, again, the clear sonorous cough which indicates the comparative healthiness of the air-passages, or does it continue to be, to a greater or less degree, the painful, inward, feeble, gurgling cough? If it is the latter, the amendment is delusive. It is one of those strange, but temporary rallyings of nature, or transient effects of medicine, which are sometimes witnessed; or, perhaps, there has been some salutary change of atmospheric influence: but there is mischief still—irretrievable mischief—and the most salutary advice that could be given to the owner would be, to dispose of the animal while something like its value can be obtained. Weeks, months may pass on; but by and by, from some slight cause—or from no cause that can be detected—the symptoms of confirmed phthisis appear, and the animal is lost.

This secondary, and more violent attack, has many symptoms similar to those that have been described as attending the later stages of bronchitis or pleurisy; but there are a few which would point out the nature and seat of the disease when there is no previous history of the case to guide the practitioner. The milk gradually diminishes, and, had it been examined before its diminution in quantity, an evident deterioration in quality would have been observed; it has acquired an unpleasant flavour—it quickly becomes sour—it spoils, or gives a peculiar taste to that with which it is mixed. The butter that is made from it is ill-flavoured, and the cheese will not acquire a proper consistence. Some have said that the milk is of a blue colour, and that it has more serum in its composition than ordinary and healthy milk.

There are few dairies in which there are not occasional differences in the quantity and quality of the produce. The disappointment and the loss of the dairyman have sometimes been considerable, and he has puzzled himself to no purpose to discover the cause; and has blamed the pasture or the servants, when his want of common observation has been the principal source of the evil. Some of our readers may recollect these occurrences in their establishments; they may also recollect that a little while afterwards one, or two, or more, of their cows had bad hoose, and were losing condition, and they got rid of them as quickly as they could.

When consumption begins to be confirmed the animal loses flesh with greater or less rapidity, and becomes evidently weak. She eats with almost undiminished appetite; but the process of rumination requiring long, and now fatiguing action of the jaws, is slowly and lazily performed. There is frequently a discharge from the mouth or nostrils, or both; at first colourless and without smell, but soon becoming purulent, bloody, and fœtid. Diarrhœa is present, and that to a degree on which the most powerful astringents can make no impression. Then, also, appears the inflammation of the tissue beneath the skin. Whatever part

of the animal is pressed upon, she shrinks; and if upon the loins, she moans with pain. The skin becomes dry and scaly; and it strangely creaks as the animal crawls staggering along.

One circumstance is very remarkable and characteristic. The mind and animal desires even of this comparatively dull and insensible being are roused to an extreme degree of intensity. The cow is, in many cases, almost continually at heat. When she is impregnated, the œstrum does not go off; and the consequence of this continuance of excitement is that she is very subject to abortion.

One of the causes of consumption, almost unsuspected by many breeders, and sufficiently guarded against only by a few—hereditary predisposition—cannot be spoken of in too peremptory terms. It is rare, indeed, that the offspring of a consumptive cow is not also consumptive. If it is a heifer-calf, she may possibly live a little after her first calving, and then she usually sickens, and the disease proceeds with a rapidity unknown in the mother. The author recollects two dairies that were almost destroyed by this hereditary taint.

Change of climate is a more frequent cause than many imagine. Some dairymen are aware how much depends on the cow being suited to the climate, or, rather, being in her native climate. This explains the strange difference of opinion with regard to breeds. Almost every farmer is partial to his own breed, and undervalues those of other districts, and even those of his neighbours; and to a very great degree he is right. His cattle breathe their native air; they are in a climate to which, by a slow and most beneficial process, and extending through many a generation back, their constitution has been in a manner moulded; and it is only after a long seasoning, and sometimes one attended by no little peril, that the stranger becomes at home in a foreign district; and so adapted and reconciled to the temperature, and degree of dryness or moisture, and to the difference of soil and herbage, as to do quite as well, and yield as much and as good milk, as in the vale in which she was reared. There is more in this than is often dreamed of in the farmer's philosophy.

Experience teaches that a change of climate involving a material difference in temperature, or soil, or herbage, is frequently prejudicial; and that while there is derangement in every system, the respiratory one seems to suffer most, and a slow, insidious, yet fatal change is there oftenest effected. If a dairy of cows is removed from a moist situation to a dry and colder one, consumption will often appear among them, although a dry air is otherwise esteemed a specific against the complaint; but if they are taken from a dry situation, and put on a woody and damp one, phthisis is sure to appear before the first season is past.

Hurtrel D'Arboval states a curious fact relating to the Swiss cattle, and connected with this part of our subject. He says that the cows in Switzerland are not subject to consumption, although they pass the spring and summer on the mountains, unsheltered, breathing the coolest and purest air, and in the autumn and winter are shut up in close and hot stables, where not a breath of pure air can reach them, except when they are driven, as they daily are, far through the snow to water. They, however, who have no upland pasture to which their cattle can be removed, and whose beasts rarely go out of the miserable huts in which they are confined and fed, lose many an animal from phthisis. Habit, and a constitution gradually formed by the influence of these changes on many a generation, had prepared the first for them, or had rendered them in a manner necessary; but habit could not secure the others from the deleterious effect of poisoned air and unwholesome or insufficient food.

There is one striking fact, showing the injurious effect of heated and empoisoned air on the pulmonary system. There are some cowhouses in which the heat is intense, and the inmates are often in a state of profuse perspiration. The doors and the windows must sometimes be opened, and then the wind blows in cold enough upon those that are close to them, and, one would naturally think, could not fail of being injurious. No such thing. These are the animals who escape; but the others at the farther end, on whom no wind blows, and where no perspiration is checked, are the first to have hoose, inflammation, and consumption. This fact speaks volumes with regard to the management in many a farm.

This is an unsatisfactory account of the nature and treatment of consumption; and, in now dismissing the diseases of the respiratory system, the author is far more disposed to direct the attention of his readers to the preventive than the medical treatment. By the former they may do much. Let the over-filled cow-houses be enlarged, and the close and hot ones better ventilated; let cruel neglect, and exposure, and starvation yield to more judicious and humane treatment; when cattle are fed on dry meat, let them have sufficient to drink two or three times every day; let those that exhibit decided symptoms of consumption be removed from the dairy, not because the disease is contagious, but because it is undeniably hereditary; and, in fine, where so little can be done in the way of cure, let nothing be omitted in the way of prevention.

CHAPTER XI.

THE STRUCTURE AND DISEASES OF THE GULLET AND STOMACHS.

THE ŒSOPHAGUS, OR GULLET.

THE food having been forced along the posterior part of the mouth by the consecutive action of the tongue and the muscles of the pharynx, reaches the *œsophagus*, or *gullet*. This tube extends from the mouth to the stomachs, and conveys the food from the one to the other. In cattle this is true in a double sense; for not only does the food descend from the mouth to one of the stomachs, when it is first gathered, but is returned for a second mastication, and afterwards, a third time, traces the same path to its destination in the true digestive stomach. We may expect, and we shall find, some peculiarity of structure in the *œsophagus*, in order to prepare it for this increased duty.

We first observe the great thickness and strength of the gullet in the ox, compared with that of the horse. It is really worth while to compare the two together, and see how that of the ox is fitted for its treble work. The outer coat of loose cellular substance is the same in both—yielding and elastic. The second coat is a muscular one, and of great substance and power. Its increased substance enables it to dilate, when the large pellets of rapidly plucked grass, or pieces of parsnip or potato, or other hard roots, enter it; and the same increase of muscular substance enables it to contract more powerfully on such food, and pass it on to the stomach. There are two layers of muscles in the gullet of all our domesticated animals, and the fibres of the outer and inner layer run in different directions, and with plain and manifest reference to the natural food and habits of the animal.

The horse lives on grass or corn; or if, when he is stabled, roots are sometimes given to him, especial care is taken that they are so cut and sliced as to pass along the gullet without danger of forming any obstruction there. The form and symmetry of the animal require that the tube shall not be large or prominent, and yet, in his state of servitude, and his labours too often capriciously exerted, little time is allowed either for rest or food. The two layers in him are thus arranged:—the fibres of the outer layer are longitudinal, which, in their relaxed state, admit of the lengthening of the tube when the neck is extended and the head brought close to the ground in the act of grazing; and by their contraction they shorten the gullet in the act of swallowing. The fibres of the inner layer are circular, which, although not adapted to extend much, in order to admit of the passage of large and hard bodies, are best calculated to contract on the kind of food which the horse swallows, and to force it down to the stomach with all the rapidity that is sometimes needed.

The fibres of both layers of the muscular coat in the ox are spiral, but they wind their way round the gullet in contrary directions, admitting thus of the lengthening and shortening of the tube in grazing and swallowing; offering, perhaps, not so much pressure on the food, and which the lazy mastication and rumination of the animal does not require; and permitting a great deal more dilatation when some large and hard substance finds its way into the gullet.

The inner coat, although a continuation of the membrane of the pharynx, is of a different character. It is more cuticular, smooth, and glistening. It lies in longitudinal plaits, so wide and numerous as sufficiently to dilate when the food passes, and to add very little to the obstacle when a portion of food unusually large is arrested in its passage.

The gullet pursues its course down the neck on the left of the windpipe, until it reaches the chest. It enters with the windpipe and blood-vessels through the opening between the two first ribs, and then winds its way along the upper part, until it reaches the diaphragm, which it pierces, and then soon terminates in a singular canal, which will presently be described.

OBSTRUCTION IN THE GULLET.

This is commonly called *choking*, whether it occurs in horses or cattle, and is far more fatal in the former than the latter, although not so frequent*. When a beast is first put on carrots, or parsnips, or potatoes, or

* Although this treatise is devoted to Cattle, yet we cannot forbear quoting a paragraph or two relating to choking in the horse. The history of these curious cases, communicated to 'the Veterinarian' by Mr. King, of Stanmore, may put the owners of horses a little on their guard.

'I was some years ago, as I was accidentally passing, called in to the horse of a coach proprietor. The owner said that his horse had a bad sore throat, and could not swallow. He could not swallow; in fact, he did not even make an attempt, on severe compression. The history being, that he had worked and fed well the preceding day, and the œsophagus, as far as it could be examined, appearing without any obstruction, I did not suspect the real cause. He was blistered and drenched, but without any good effect, all the liquids returning without any efforts to swallow. On the third day after I first saw him he died. I much wished to ascertain the cause of the obstruction, and which proved to be a large ball of tobacco ashes, wrapped up in a double paper, and which rested in the œsophagus, about half way between its entrance into the chest and the stomach. All knowledge of its having been given was stoutly denied, but it was afterwards confessed that the nostrum was exhibited as a supposed cure for worms.

'A cause of choking, and which has killed many horses, likewise exists in a notion that new-laid eggs will improve condition. I believe the practice is, previously to giving the egg, to star the shell in a few places; and when the shell has not been sufficiently weakened to yield to the pressure of the parts, the mischief ensues. I was once called to a very violent horse with supposed sore throat. He had taken nothing for two days. The

turnips, he is very apt to be choked. The first mastication is always a very careless affair, and everything that is put before the animal is swallowed with very little chewing. If the herdsman has not been attentive in slicing or bruising the roots, mischief of this kind is likely to happen. It happens oftener than the cow-herd or the owner is willing to confess, when eggs, either to promote condition in cattle, are given whole, or loaded with tar, or some nauseous drug, in cases of blain, hoose, maw-sick, or other supposed stomach complaints.

When the root sticks in the gullet, and can be evidently seen and felt there, the farmer or the cowherd first gets his cartwhip—in good hands, not a dangerous instrument, on account of its being pliable and yielding; others take a cart-rope, which is somewhat more objectionable, because the ends may do mischief. They who have neither good sense, nor regard for the sufferings they may inflict, take even a common rack-stave. Whatever it be, they thrust it down the gullet, and work away, might and main, to drive the offending body down.

There is no doubt that some instrument should be introduced into the gullet in order to push the root into the stomach, but it is the force that is used to which we object, and that does all the mischief. A case or two will illustrate this. The first occurred in the practice of Mr. King. A cow was choked with a turnip; the rack-stave was had recourse to, and the owner was sure that 'he had passed the turnip, for the cow had swallowed a drink that had been given.' Still she was not doing well; there was no rumination, and she would neither eat nor drink. Mr. King was sent for. He found his patient low and feverish, and she heaved considerably; she swallowed everything that was poured down the throat; there was no swelling of the neck; no tumour could be felt externally, and the probang went its full length into the stomach. The practitioner gave the proper medicines in such a case, but on the third day the beast died. On examining her it was found that the rack-stave had been used with so much force as to make a considerable rent in the œsophagus, through which the turnip escaped, and lay in the surrounding cellular membrane.

The second case occurred to the writer of this treatise. A market gardener, on rooting up his parsnips, ordered them to be cut into small pieces and given to his cattle. The hind gave them whole, and the beasts greedily devoured them. A large piece stuck in the gullet of a valuable cow, and was evidently seen and felt about half way down the neck, and the poor animal began to swell enormously, and panted sadly. The cow-leech was sent for, who using, first, the butt-end of a cartwhip, and afterwards a long and stout osier rod, forced it into the chest, and then had no more power over it with either of his rude instruments. The author was now sent for. On applying a probang, he found the obstruction about three inches within the thorax, and he soon ascertained that it was firmly impacted there. The application of force in the common way was out of all question; he, therefore, withdrew the slider which guarded the protrusion of the stilet, and endeavoured to move the obstruction forward by slight but repeated percussions, and was convinced that he was gaining ground, although very slowly. He persisted, and after the expiration of about twenty minutes the parsnip gave way, and the probang entered the stomach.

attendant swore *he* could not account for it; but as the animal had every general indication of health, I gave little credit to his statement. Having properly secured the horse, I passed the probang down the throat, in doing which I experienced some resistance. On its return to the mouth the bulb was literally covered with fragments of egg-shell. The horse was soon well; but I doubt, if this egg had not been weakened, whether the quiet introduction of the instrument would have broken it down in that situation.

—*Veterinarian*, January, 1833.

A vast quantity of gas, mixed with fluid of a very foetid character and small portions of food, was violently discharged. The enlargement of the belly subsided, and the animal experienced sudden, and, as it was thought, perfect relief. By way of making everything sure, she was bled, and a dose of physic was given to her; but in eight-and-forty hours she was dead. The whole of the gullet, from about eight inches below its commencement to within the same distance from the stomach, presented a mass of laceration and inflammation which had destroyed her.

DESCRIPTION OF THE ŒSOPHAGUS PROBANG.

Every farmer should have a flexible probang ready for use, either of the improved kind, as contrived by Mr. Read, or on the plan of that which was first introduced by Dr. Monro.

This cut will give a sufficient idea of the construction of the most useful probang, or Œsophagus-tube:—

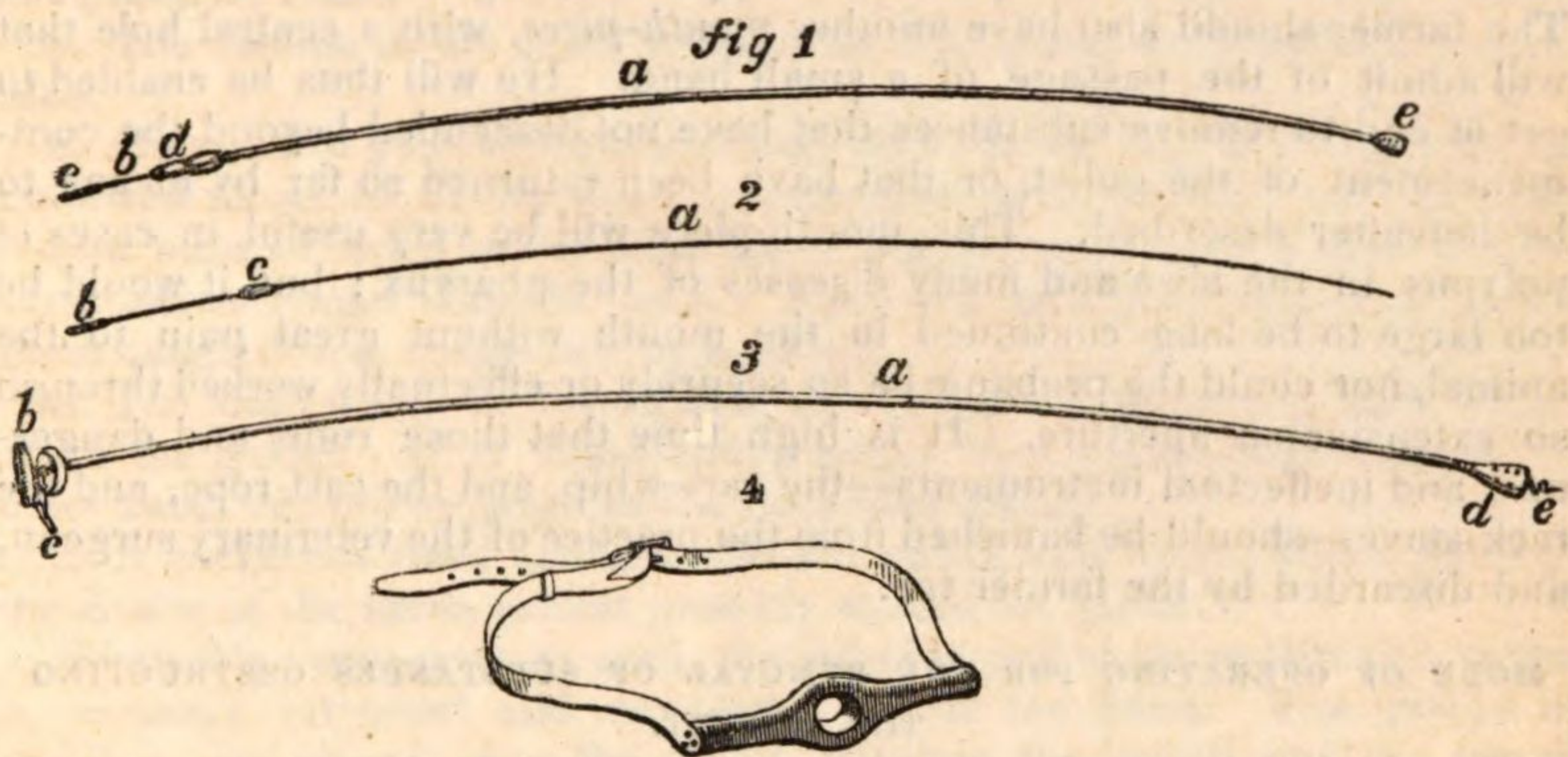


Fig. 1. a. The tube, made either of simple leather, or of leather covering a canal formed of spiral wire. It is about four feet and a half in length, so as to reach from the mouth to the rumen, and leaving a sufficient portion outside the mouth for it to be firmly grasped.

b. The stilet, represented as introduced into the tube, and running the whole length of it. It gives greater firmness and strength to the tube, when it is either passed into the stomach in cases of hoove, or used to force any thing down the gullet.

c. The handle of the stilet.

d. A hollow piece of wood running freely upon the stilet, and placed between the handle of the stilet and the round extremity of the tube. The stilet is longer than the tube by the extent of this piece of wood, but is prevented from protruding beyond the bulb of the tube at the other end by the interposition of this slider at the handle. The stilet may be introduced at either end of the tube. It is usually inserted at *e* when the instrument is used to force any obstructing body down the throat, because the enlarged and bulbous termination of the tube at the other end has a flat or rather concave surface, and can therefore act with more effect and power on the substance which sticks in the throat.

e. The end of the tube which is introduced into the paunch in cases of hoove. Its rounded extremity will permit it to be more easily forced through the roof of the paunch, and it is perforated with holes for the escape of the gas with which the paunch may be distended.

Fig. 2 represents the whalebone stilet, with the hollow piece of wood running upon it, and shows how easily it may be withdrawn from the stilet when that is taken out of the tube. The running piece of wood being withdrawn, if the handle of the stilet is then pushed down on the bulb of the tube, a portion of it will project at the other end; and by moving the stilet up and down in the tube, this may be made to act on the obstructing body in the manner and with somewhat of the force of a hammer.

Fig. 3 will be presently described.

Fig. 4 is a piece of thick strong wood, widest at the centre, and there perforated. It is introduced into the mouth in order to keep it open during the use of the probang, which is inserted through the hole in the centre. Leathern straps are nailed to the extremities: these are buckled round the horns, and by means of them this mouth-piece is securely fastened; while one of the extremities, being grasped by the operator, forms a very useful point of support during the use of the tube. The farmer should also have another *mouth-piece*, with a central hole that will admit of the passage of a small hand. He will thus be enabled to get at and to remove substances that have not descended beyond the commencement of the gullet, or that have been returned so far by means to be hereafter described. This mouth-piece will be very useful in cases of polypus in the nose and many diseases of the pharynx; but it would be too large to be long continued in the mouth without great pain to the animal, nor could the probang be so securely or effectually worked through so extensive an aperture. It is high time that those rude, and dangerous, and ineffectual instruments—the cart-whip, and the cart-rope, and the rack-stave—should be banished from the practice of the veterinary surgeon, and discarded by the farmer too.

MODE OF OPERATING FOR THE REMOVAL OF SUBSTANCES OBSTRUCTING THE GULLET.

Let it be supposed that a cow has swallowed a potato, or turnip, too large to descend the gullet, and which is arrested in its progress, and evidently seen at a certain distance down the throat. The farmer should have immediate recourse to the œsophagus-tube, introducing the flatter end into the throat, and using moderate force. If the obstructing body yields to this, he will be justified in pushing it on within the chest; but if, with the application of a fair degree of force, it is very slowly, and with difficulty pushed on, the operator should instantly relinquish the determination to drive it down, for the fibres of the muscular coat of the gullet soon become irritated by the continued distention, and contract powerfully, and, as it were, spasmodically, upon the foreign body, and imprison it there. It should also be remembered that the gullet itself becomes smaller as soon as it has entered the thorax; and, consequently that, which could not be moved without difficulty in the upper part of the neck, will not be moved at all in the lower portion of it.

The next consideration then is, whether, although the obstructing body cannot be driven on, it may not be solicited, or forced backwards. The fibres of the upper part of the gullet have already yielded, and suffered this substance to pass them—they are somewhat weakened by the unnatural distention—they have not yet had time to recover their tone, and they may yield again. It is at least worth the trial.

The internal coat of the œsophagus is naturally smooth and glistening; it may, however, be made more so, and the surface of the obstructing body may be polished too. A half-pint of olive oil should be poured down

the throat, and an attempt then made with the fingers, applied externally, to give the body a retrograde motion. By patient manipulation this will be effected much oftener than is imagined. The intruding substance will be dislodged from the situation in which it was impacted, and will be brought to the upper part of the œsophagus, or even into the pharynx, and will then be sometimes got rid of by the efforts of the beast itself, or may be easily drawn out by means of a hand introduced through the large mouth-piece to which reference was made in the explanation of the œsophagus-tube.

If the obstructing body cannot be moved in this way, we are not yet without resource. Mr. Read has made an important improvement on, or addition to, the œsophagus-tube, in the form of a corkscrew. Vide fig. 3, in the preceding cut.

a. The leather tube, as before, but somewhat larger, and longer, and stronger; and the upper part of it, for the purpose of additional strength, composed of brass.

b. The handle of the stilet which runs through it, as through the other tube.

c. One of two pieces of wood placed between the handle and the tube; hollowed so as to fit the stilet; removable in a moment, and, like the hollow piece of wood in the other tube, permitting the stilet to be two or three inches longer than the tube. They are here removed, and one of them hangs down, suspended by a string.

d. The bulb which is introduced through the mouth-piece, and forced down the gullet. It is considerably larger than those at the ends of the other tube, but not so large as the distended gullet.

e. A corkscrew fixed to the end of the stilet, and which, coming out in the centre of the knob, cannot possibly wound the gullet.

When this instrument is used, the stilet is pulled up so that the screw is perfectly retracted and concealed within the knob. The pieces of wood, *c*, are placed upon the stilet, between the handle and the top of the tube, and tied there, so that the screw is now fixed within the knob; and the instrument is introduced through the mouth-piece, and forced down the throat until it reaches the obstruction. The pieces of wood are then untied, and, by turning the handle, the screw is worked into the obstructing body, as the common corkscrew is into a cork in the neck of a bottle. If the potato or the turnip is fresh and sound, it would hardly be credited what purchase is obtained, and in how many instances the nuisance may be drawn up the throat and got rid of. If the centre of the root should give way, and a portion of it only be brought out, there is still some good done, and the screw should be returned again and again, until it will no longer take hold. By this time, probably, the root will have been so weakened and broken down that it will yield to the pressure of the first probang, and be forced along into the rumen; or at least it will be so weakened, that the stilet of the first tube may be used with advantage.

The stilet must be withdrawn from the tube, and the running piece of wood taken away; the stilet is then returned to its sheath, and may be made to project a couple of inches beyond the knob. It is retracted, and the tube is passed into the throat; when it will be evident that the operator may use either the comparatively broad part of the knob, or the small and sharp stilet, as the case may seem to require. To the first he can only apply simple pressure—to the stilet he can give a percussive action. By sharply pushing down the handle of the stilet, he will make the other end act with the power of a little hammer, and thus more break down, and

probably work through, the centre of the root, as in the case which has been just related. A perforation having been made through the centre, and the obstruction having been previously torn and weakened by the screw, the whole may gradually be broken down, or will more readily yield to pressure.

These directions have been founded on the supposition that the foreign body is lodged in the gullet above the entrance into the thorax; and if the operator fails in all these contrivances, perhaps he will now admit, although reluctantly, the application of external force. It has been recommended to place a small piece of wood against the gullet, and in contact with that portion of the skin which covers the obstructing body, and then, with a wooden mallet, to hammer away against the opposite side. The root has been thus occasionally broken down, and then forced on with the cart-whip; but more frequently the beast has been sadly punished without any good effect having been produced; and, in some instances, although the nuisance was for awhile got rid of, so much tenderness of the gullet remained, and inflammation arose, and ran to such an extent, that the animal did not regain its appetite for many weeks afterwards, or pined away, and became comparatively worthless. The practitioner will, therefore, unwillingly have recourse to this, and will be justified in first seeing what bleeding will do. There is not a more powerful relaxant than bleeding—and especially when it is carried on, if necessary, to absolute fainting. For awhile every spasmodic action ceases, and every muscular fibre loses its power to contract. The operator will, probably, take advantage of the momentary relaxation, in order to force the body either upwards or downwards—upwards first, and by far in preference; or if downwards, yet still cautiously balancing in his mind the degree of resistance with the chance of ultimate success; for, if the resistance continues to be considerable, he may depend upon it that when he has arrived at the thorax, all further efforts will be fruitless, and the patient will be lost.

He has one last resource, and he needs not to be so afraid of venturing upon it as some practitioners have been. There is the operation of *œsophagotomy*, or the cutting down upon the obstruction, and thus removing it. The veterinary surgeon will never find, or ought never to find, difficulty here, although the human surgeon is deemed bold who ventures upon the operation.

After having passed a little way down the neck, the *œsophagus* is found on the left of the trachea, and between the carotid and the jugular. The artery will be detected by its pulsation, and the vein by its turgescence. The only muscle that can be in danger is the sterno-maxillaris, and that may, in a very great majority of cases, be avoided, or, if it is wounded, no great mischief will ensue.

The animal should be cast, (at least this is the safest way, as it regards both the operator and the patient). It should be thrown on the right side, and the head should be a little stretched out, but lying as flat as the horns will permit. The place of obstruction will be seen at once. An incision is by some persons made immediately into the gullet, sufficiently long for the extraction of the root. The safer way, however, is for the cellular substance to be a little dissected away before the gullet is opened, when, if the incision is long enough, the incarcerated body will readily escape. The edges of the *œsophagus* should then be brought together, and confined by two or three stitches; the skin should also have the same number passed through it, the ends of the stitches of the gullet having been brought through the external wound. The beast should have nothing but gruel for two or three days; and, after that, gruel and mashes

for a little while longer. In a fortnight or three weeks the wound will generally be healed, and scarcely a trace of the incision will be visible.

If the obstruction is not observed, or the practitioner not called in until the potato or parsnip has passed into that portion of the gullet which is within the thorax, the chances of saving the animal are materially diminished. The common probang should first be tried, and, that failing, the corkscrew should be resorted to, either to draw the body out, or so to pierce it and break it down, that it may be forced onward either by the stilet or the knob. The practitioner must stand at little ceremony here, and he should, if necessary, use all the force he can; for, if the obstruction is not overcome, the animal will assuredly perish.

It has often been observed, and with much truth, that cows, in whose gullet this obstruction has once taken place, are subject to it afterwards. Either they have a habit of voracious feeding, or the muscles are weakened by this spasmodic action, and not able to contract upon the food with sufficient force for the ordinary purposes of deglutition. It will therefore generally be prudent to part with the cow that has once suffered from an accident of this kind.

STRICTURE OF THE ŒSOPHAGUS.

This rarely occurs either in horses or cattle. It is, however, a little more frequent in the latter than in the former. The writer of this treatise has met with only one marked case of it. The cow had been observed to be a slow feeder: she was grazing when the others were ruminating; and she was ruminating long after they had been busily employed in grazing. At length the owner, being more attentive than the proprietors of cattle generally are, observed that the food occasionally accumulated in the upper part of the gullet until there was a swelling eight or ten inches in length, terminating in an evident contraction of the Œsophagus. She was then in rather low condition, and was gradually losing flesh. Sometimes, with an effort, she could force the contents of the gullet along their proper course; then, two or three days or a week would elapse before anything would again accumulate there; and, at all times, the proprietor could easily press down the food which was thus interrupted in its passage. It was an evident stricture of the Œsophagus; and, so far as could be learned, the diameter of the gullet had been gradually lessening at this point.

The practitioner recommended that she should be destroyed; alleging that a cure was improbable, and must, at the best, occupy a long period of time, and be expensive. She was young in calf, and that by a valuable bull, and he was desired to do what he could. He passed a probang through the stricture, as large as, without too great violence, he could manage, and confined it there for an hour by means of tapes. The cow was violent, but still this was accomplished for a few days, when a larger probang was used; but at length she became perfectly unmanageable. She was then cast, and the introduction of the probang attempted; but there was an awkwardness about it, and her violence threatened injury to herself and those about her. Some ground, however, had been gained; and with that the owner, tired of the trouble, and afraid of the expense, expressed himself contented. The food accumulated less frequently, and, soon after her calving, ceased to accumulate at all.

RUPTURE OF THE ŒSOPHAGUS.

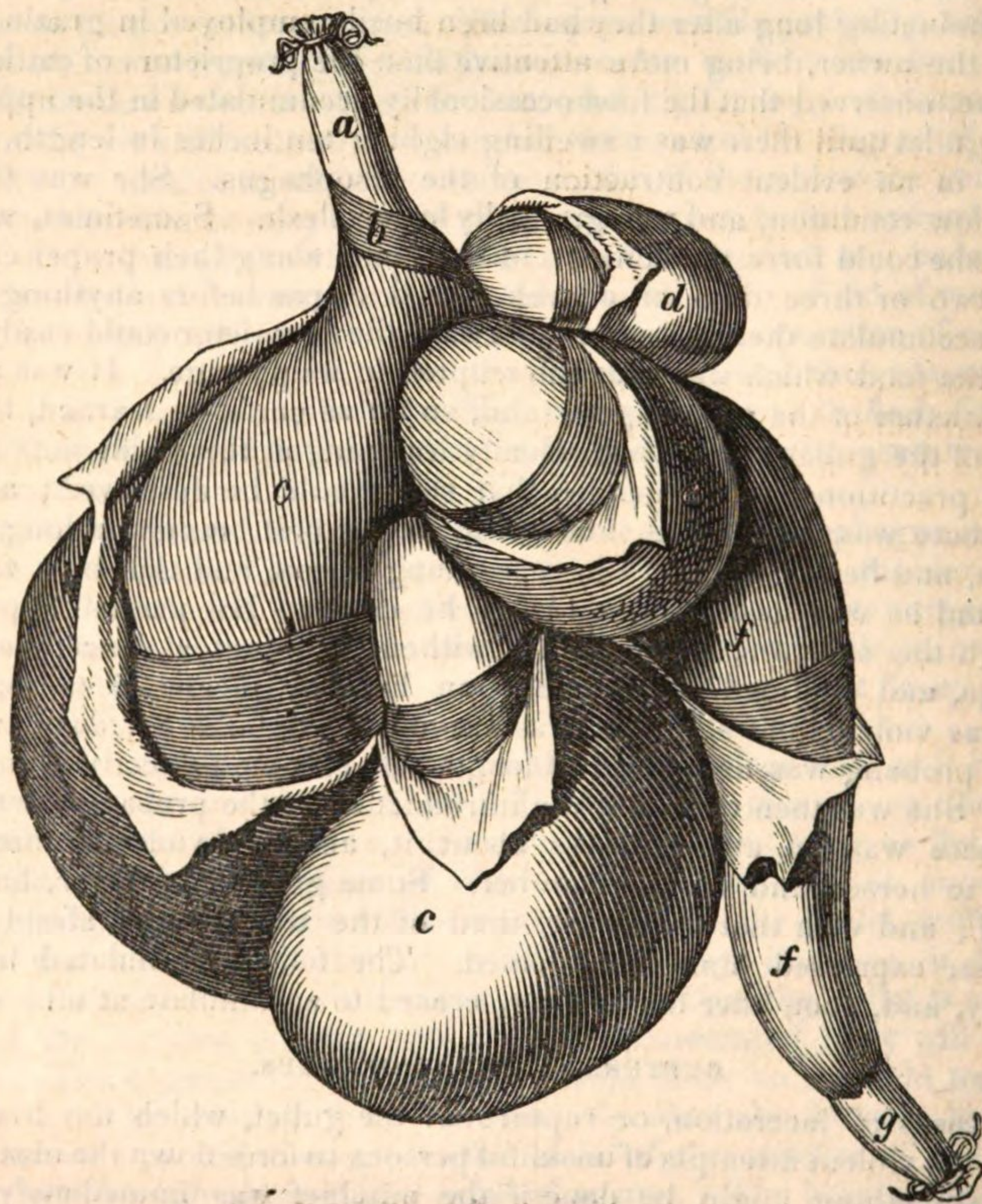
In cases of laceration, or rupture of the gullet, which too frequently follow the violent attempts of unskilful persons to force down the obstructing body, something might be done if the mischief was immediately ascer-

tained. Prudence, however, would dictate the sacrifice of the animal, while it could be fairly sold to the butcher.

If the cure is undertaken, the part must be opened—the foreign body liberated from the cellular texture into which it had probably been driven—all the dirt and indigested matter cleared carefully away—the ragged and lacerated edges cut off—the divided portions brought as neatly and as closely together as possible—and the whole secured by bandages passed several times round the neck; while the animal is allowed gruel only for many a day, and then mashes. The dressing should be the healing ointment, daily applied. The power of nature is great; and, the foreign body having been removed before it could cause inflammation and mortification by its presence, the parts may be reinstated to every useful purpose.

THE ŒSOPHAGUS WITHIN THE THORAX.

As the Œsophagus approaches the chest it takes a direction more and more towards the left, and enters it on that side of the windpipe. It is there found between the laminæ of the mediastinum, following the direction of the dorsal vertebræ. It passes, as in the horse, by the base of the heart, leaving the venæ cavæ on the right, and the aorta on the left. It by degrees separates itself from the spine, but not so much as in the horse, penetrating between the lungs, and, pursuing its course towards the diaphragm, passes through the great opening between the crura of



that muscle. As it travels through the mediastinum and between the lungs, it diminishes in size, and acquires considerable firmness of texture; but it has no sooner entered the abdomen, and begun to dip downwards, than it becomes more muscular, and less firm in its structure. It also rapidly increases in size until it assumes almost the shape of a funnel; and terminates directly in no particular stomach, but in a canal which opens into all the stomachs, of which, as will be seen, the ruminant possesses four.

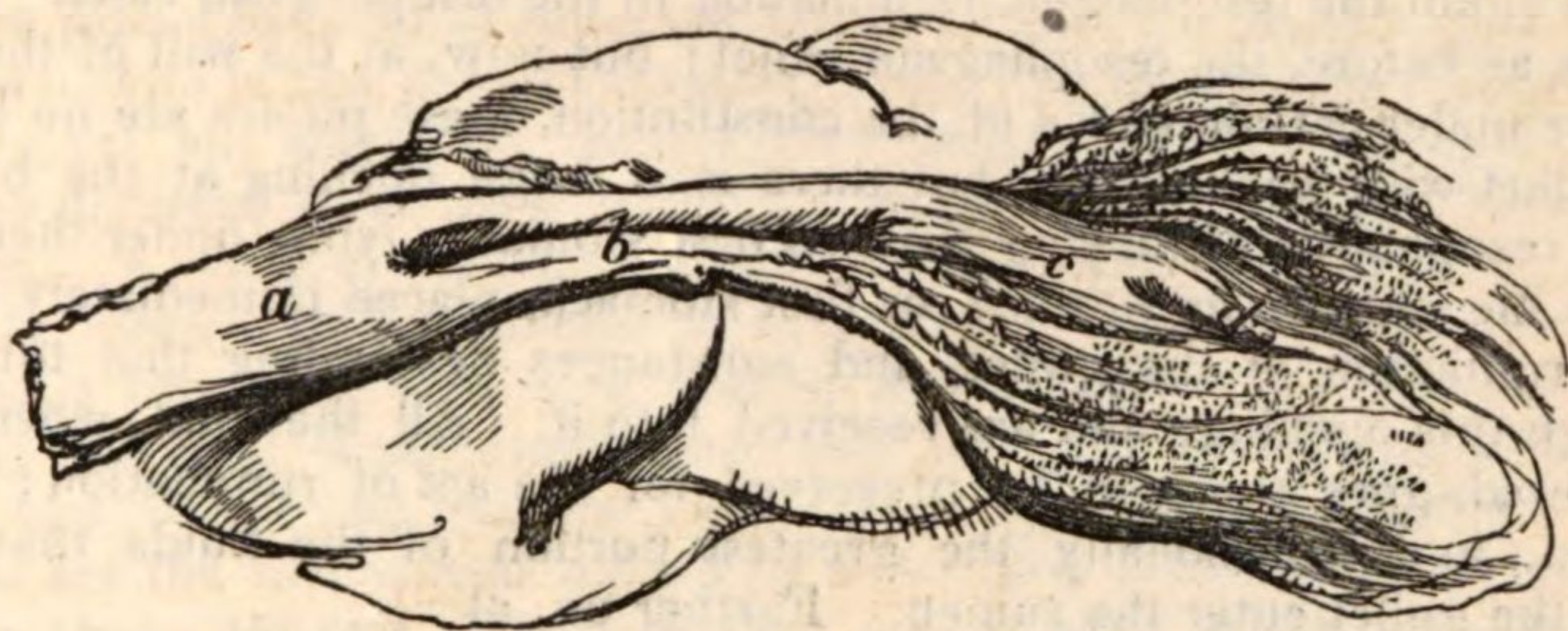
Recourse must be had to a few cuts in order to render this intelligible to the reader.

The cut in the preceding page will exhibit the form of the stomachs when filled, their relative situations, and their connexion with each other.

a. The œsophagus gradually enlarging as it descends, and apparently running into the rumen or paunch, but, in fact, terminating in a canal.

b. A continuation of the spiral muscles of the œsophagus, thicker and more powerful as they approach the termination of that tube.

Before the reader proceeds to the consideration of the other parts delineated in that cut, it may be advantageous to take a different view of the structure and termination of the gullet.



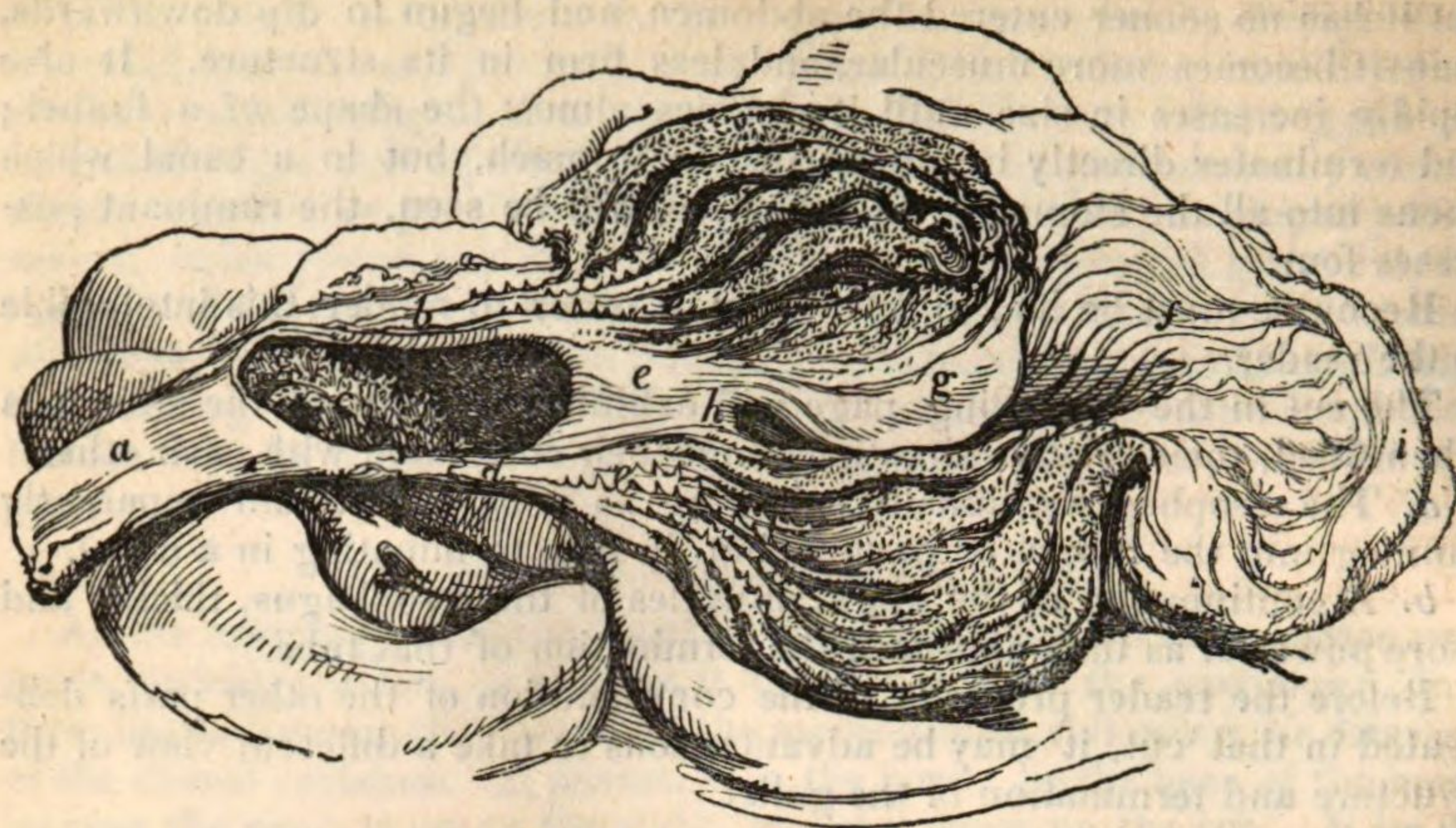
a. The œsophagus enlarging as it descends, and becoming more muscular, and particularly the upper and posterior part of it. The continuation of it along the stomachs is slit up, in order to show that it would form the continuous roof of the canal which is here laid open, and which leads to the third and fourth stomachs.

b. The *œsophagean canal* exposed by slitting the roof from the termination of the gullet to the third stomach. A considerable part of the floor is composed of two muscular pillars, lying close to each other. It would therefore appear, at first inspection, to be a perfect canal, and that what descended into it from the gullet would run on to the third and fourth stomachs. These pillars are duplicatures of the roof of the first and second stomachs, which lie immediately underneath them.

c is the continuation of the same canal into and through the many-plum, or third stomach, which is known by its leaves and thin hooked edges.

d is a prolongation of the same canal into the fourth, or true digestive stomach. It is easy therefore to perceive that the food, whether solid or fluid, may, at the will of the animal, or under particular circumstances of the constitution, pass into the third and fourth stomachs, without a particle of it entering into the first or second; and we know that this is the case with the food after it has undergone the process of rumination, or a second mastication.

The following cut will give another view of the same parts



a is again the œsophagus, terminating in the œsophagean canal

b is, as before, the œsophagean canal; but now, at the will of the animal, or under certain states of the constitution, these pillars are no longer in contact with each other, but there is a large opening at the bottom of the œsophagus displaying the two first stomachs lying under them.

c is the *rumen*, or *paunch*, or first stomach, placed immediately under the termination of the gullet, and substances descending that tube fall through this opening, and are received into it. All the food, when first swallowed, goes there to be preserved for the act of rumination; and a portion, and occasionally the greatest portion of the fluids that pass down the gullet enter the rumen. Farther on, at

d, is the *reticulum*, or second stomach. From the state of that stomach, or at the will of the animal, the muscular pillars here also relax, seldom or never to permit that which is passing along the œsophagean canal to enter the reticulum, but that the contents of the reticulum may be thrown into the œsophagean canal. This is the case when the pellet of food is returned for remastication,—it is thrown into the canal from the reticulum—it is seized by the powerful muscles at the base of the gullet, and carried up by the spiral muscles of that tube in order to be remasticated. It will be seen the upper pillar (situated towards the right in the living subject), and the lower part of the opening made by the relaxation of the pillars, belong to the reticulum; the lower pillar and the anterior portion of the opening (situated towards the left) belong to the roof of the rumen. This is very satisfactorily seen in the dried stomachs of a young calf.

e is the *manyplus*, or third stomach, and through which the canal is still to be traced to.

b. The *abomasum*, or fourth or true digesting stomach. So that, as was asserted, this canal leads to no particular stomach exclusively, but to all of them, according to circumstances.

We are now, perhaps, prepared to return to the consideration of the first cut (p. 422).

c c represent the form of this stomach in the greater part of ruminants, and particularly in oxen and sheep. It is situated somewhat obliquely in the abdominal cavity, and occupies nearly three-fourths of it. It

is divided into two unequal compartments, or sacs, and reaches from the diaphragm to the pelvic cavity. By its superior surface it is attached to the sublumbar region by its vessels, nerves, and a portion of mesentery. On the right side it is covered by a portion of the intestines; on the left side it is more elevated, and is in contact with the left flank. It is on this account that we are sometimes induced to adopt the unsurgical mode of giving relief in cases of hoove; for when we plunge our lancet or knife into the left flank, we puncture the distended stomach. Its inferior surface rests upon the floor of the belly. The left side reaches to the diaphragm, and thence, under the left flank, to the pelvis. The right side rests on the floor of the abdomen, and is covered by the fourth stomach. The anterior extremity is attached to the diaphragm by the œsophagus, and by the cardiac ligament; and the right extremity floats free, generally occupying the pelvis, but pushed thence in the latter period of gestation.

Deep scissures not only divide it into two lobes, as has been mentioned, but another scissure posteriorly, which will be shown in the next cut, forms it into two others; so that its interior presents four compartments, separated from each by deeply projecting duplicatures of the walls of the stomach.

This cut represents two of the three coats of the rumen.

The external, or *peritoneal*, coat is here represented as turned back at different places in order to show the muscular coat, which, as in the horse, consists of two layers, the one running longitudinally and the other transversely; yet not accurately so, for they appear to run obliquely, and in many different directions, according to the varying curvatures of the stomach. A very erroneous opinion of this great macerating stomach would be formed by considering it as a mere passive reservoir in which the food is contained until it is wanted for rumination: it is in constant motion; the food is perpetually revolving through its different compartments, and undergoing important preparation for future digestion. These muscles are the mechanical agents by which this is effected, and by running in these different directions they are enabled to act upon all the differently-formed cells of this enormous viscus.

d. The *reticulum*, or *honey-comb*, or second stomach, viewed externally, and supposed to be filled. It is a little curved upon itself from below upwards, and is the smallest of all the stomachs. It rests against the diaphragm in front of the left sac of the rumen, and is placed under the œsophagus, and upon the abdominal prolongation of the sternum. There are two layers of muscles belonging to this stomach, one of them running longitudinally and the other transversely, as in the rumen.

e gives the external appearance of the *manyplus*, or third stomach. It is less rounded, and longer than the reticulum. It is curved upon itself from above downwards. Its little curvature is applied on the left, partly over the reticulum, and more on the paunch; and on the right, it is placed over the base of the fourth stomach. It is situated obliquely from the right side of the abdomen, between the liver and the right sac of the rumen. Girard thus describes it:—"Its anterior face rests against the liver and the diaphragm—its posterior is placed over the right sac of the rumen. Its great, rounded, convex curvature is attached to the fourth stomach, and also to the rumen, by a prolongation of mesentery; and its little curvature is continuous with that of the reticulum."

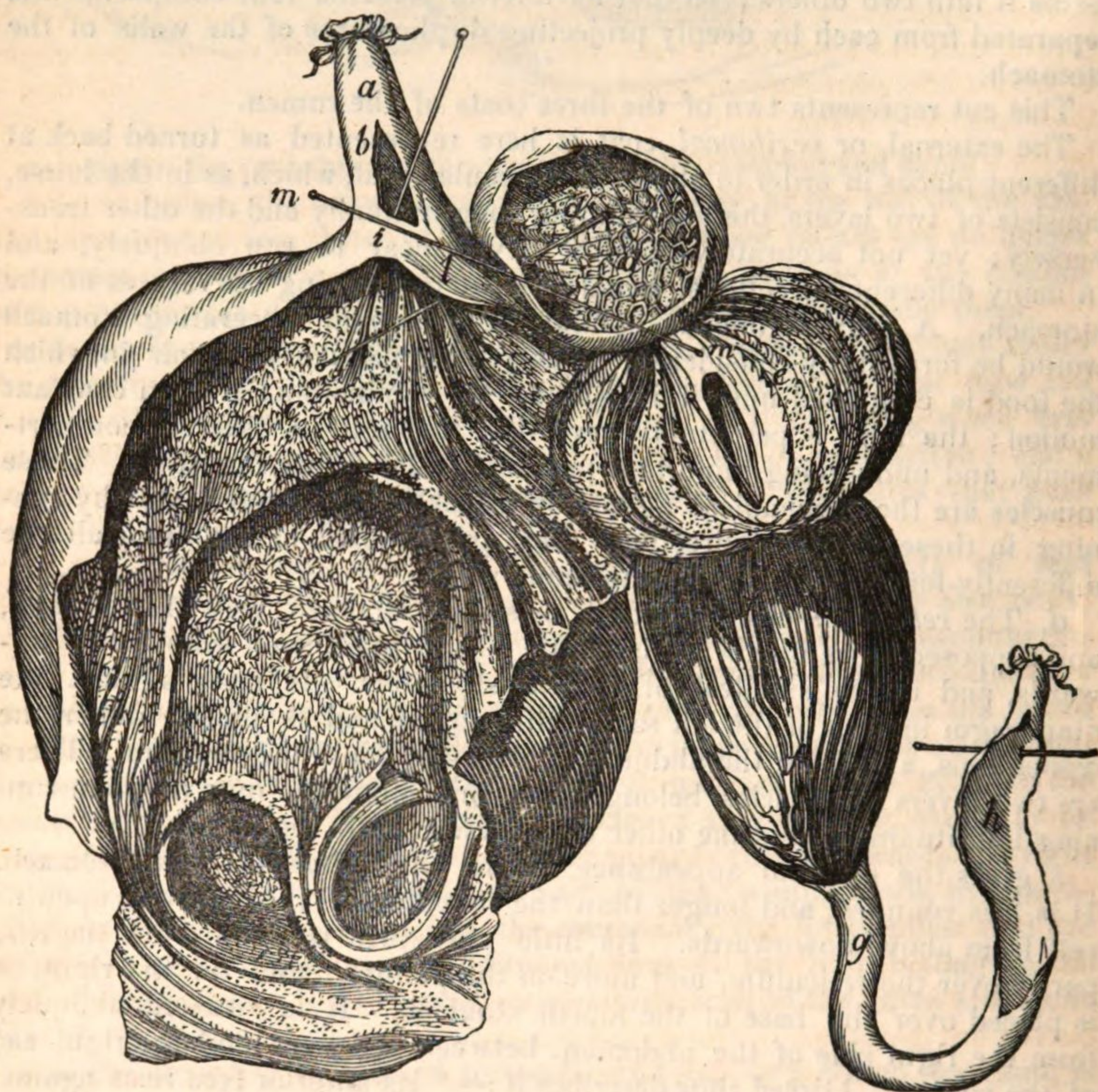
Fig. 1 and 2 represent the two layers of muscles as before.

f. The *abomasum*, or fourth stomach, is described by Girard as "elongated, and of a cone-like form, yet somewhat bent into an arch, situated obliquely to the right of and behind the manyplus, and between the dia-

phragm and the right sac of the rumen." It has two free or unattached faces, one against the diaphragm and the other against the right sac of the rumen—two curvatures, the inferior and larger convex, and giving attachment along its inner border to a portion of mesentery, which extends to the inferior scissures of the rumen; and the superior or smaller receiving the portions of mesentery which go from the reticulum to the superior scissures of the rumen. It is also said to have two extremities, the one anterior, which is the largest and placed inferiorly, adhering to the smaller curvature of the manyplus, and constituting the base, or great extremity of the abomasum—and the posterior and superior, which is narrow, elongated, curved above and backwards on the superior face of the right sac of the rumen, and called the smaller or pyloric extremity.

A dissection of the muscular coat is given here as in the other stomachs. *g* represents the commencement of the *duodenum*, or first intestine.

The reader is now prepared for the consideration of the interior of these stomachs.



a. The *æsofagus*, as before, enlarging, and assuming a funnel-like shape as it approaches the stomachs.

b. The *æsofagus* cut open at the commencement of the *æsofagean canal*, in order to show its communication with the first and second stomachs.

c. The rumen laid open and divided into its different compartments by scissures, more or less deep, and which on the internal surface appear as indentations, or duplicatures of the coats of the stomach. They are re-

cognized under the name of the double-tripe when prepared for the table. The rumen is divided into two large sacs, seen in the cut of the external form of the stomachs (p. 422), and the walls that separate them are thick, and perpendicular to the surface of the stomach, so as to form a very considerable separation between the compartments of the stomach. These again are subdivided by transversal bands, which form smaller compartments. Two, belonging to the posterior portion of the stomach, are given in this cut. There are similar divisions in the anterior sac, but which are here concealed by one of the folds of the stomach.

The whole of the rumen is covered by a cuticular membrane, constituting the third or inner coat. Immediately under this, and arising from the interposed tissue between the muscular and cuticular coats, there are innumerable small prominences or papillæ. They are of different sizes and forms in different parts of the rumen. Towards the longitudinal bands or duplicatures they are small, and thinly set; they are more numerous and larger towards the centre of the compartments; and largest of all in the bottom of the posterior and most capacious sac. In every part of the rumen they are more thickly set, and broad and strong towards the centre or bottom of each compartment. They are also harder and blacker in these places. When regarded in different compartments, they appear to be bent or inclined in different directions; but when they are more closely examined, they are all inclined in the direction which the food takes in its passage through the various divisions of the rumen. They are evidently erectile, and may sometimes bristle up and oppose the passage of the food; while at other times they yield and bend, and suffer it to pass with little or no obstruction. Some have imagined that these are glandular bodies, and that they secrete a peculiar fluid; others confine the glandular apparatus to the tissue between the cuticular coat, and numerous little prominences, which can be seen in the inflated stomach of a young ruminant when exposed to the light, are best accounted for by considering them as glandular bodies.

There are two openings into the rumen; the one already spoken of at the base of the œsophagus, and through which the substances gathered at the first cropping of the food, and perhaps all solids fall, and a considerable proportion of the liquids swallowed. The other opening is below this. It is larger and always open; it communicates with the second stomach; but there is a semilunar fold of the rumen that runs obliquely across it, and acts as a valve, so that nothing can pass from the first into the second stomach, except by some forcible effort; and it is very seldom that any thing is returned from the rumen directly into the œsophagus.

Considering the size of the paunch, it has very few blood-vessels; in fact, it has not much to do except macerating the food. The arteries are supplied by the splenics, which are of very great size in ruminants. The nerves are given out by the celiac plexus.

d. The reticulum, or second stomach. The cuticular coat here covers a very irregular surface, consisting of cells, shallower and wider than those of a honey-comb, but very much resembling them; hence this stomach is sometimes called the *honey-comb*. Each of these divisions contains several smaller ones; and at the base and along the sides of each are found numerous minute prominences or papillæ, which are evidently secreting glands.

There are two openings into this stomach; one through the floor of the œsophagean canal, one of the pillars of which is formed of a duplicature of the coats of the lesser curvature of the reticulum. The other is that already described, between this stomach and the rumen.

The muscular coat of this stomach is thick and powerful, but the blood-vessels are not numerous; for it will hereafter appear that its functions are very simple. The arteries and nerves of the reticulum are derived from the same source as those of the rumen.

e. The *manyplus*, or third stomach. The internal structure of this stomach is very singular. The œsophagean canal changes its form and character at the commencement of the manyplus, and the fleshy pillars, of which mention has been so often made, unite, forming a kind of obtuse angle. The floor of the canal is now perfect, and nothing can any longer fall into the stomachs beneath. A small circular aperture alone is left between them, which conducts to the third stomach, the floor of which is closed, but the roof is constructed in a remarkable way. The whole of the stomach contributes to form this roof; and from it there descend numerous duplicatures of the cuticular coat, each duplicature containing within it cellular tissue, blood-vessels, and a thin but powerful layer of muscles. They are formed into groups. A long duplicature, resembling a leaf or curtain, hangs from the roof, and floats free in the stomach, and reaches nearly down to the floor. On either side of it is a shorter leaf, and beyond that a shorter still, until the outer leaf becomes very narrow. Then commences another group with a long leaf in the centre, and others progressively shortening on each side, until the stomach is filled with these leaves, hanging down from every part of it, floating loosely about, and the lower edge of the longest of them reaching into the continuation of the œsophagean canal.

The cuticular covering of these leaves is peculiarly dense and strong, and thickly studded with little prominences; so that when the leaf is examined it exhibits a file-like hardness, that would scarcely be thought possible; and is evidently capable of acting like a file, or a little grindstone. These prominences are larger and harder towards the lower part of the leaf; and, in the central leaves, assume the form and office of little crotchets, or hooks, some of which have the hardness of horn, so that nothing solid or fibrous can escape them.

These groups of leaves vary in number in different animals, and the number of leaves constituting each group vary too. They float thickest, and the canal is smallest at the entrance into this stomach, where they are most wanted. Towards the fourth stomach the course is left more open.

As would be expected, from the complicated mechanism of this stomach, it is more abundantly supplied with blood-vessels and with nerves than the second, or even than the first, although that is many times larger than the third.

f. The *abomasum*, or fourth stomach, is lined by a soft villous membrane, like the digestive portion of the stomach of the horse. It also contains a great number of folds, or leaves, somewhat irregularly placed, but running chiefly longitudinally. They are largest and most numerous at the upper and wider part of the stomach; and one of the folds, in particular, is placed at the entrance into the abomasum, yielding to the substances which pass from the third stomach into the fourth, and leaving, as it were, a free and open way, but opposing an almost perfect valvular obstruction to their return. This explains the reason why vomiting is so rare in the ruminant; and that when it does occur, it must be produced by such violent spasmodic efforts as to cause or indicate the approach of death. See *g* and *h*, p. 424.

Towards the lower and narrower part of the stomach these folds are less numerous and of smaller size: they are also more irregular in the course which they take; some of them running obliquely and even transversely.

This coat of the stomach, when the animal is in health, is thickly covered with mucus, while, from innumerable glands, it secretes the gastric juice, or true digestive fluid.

The pyloric or lower orifice of this stomach is guarded by a rounded projecting thick substance, by which the entrance into the intestine is much contracted, and which, indeed, partly discharges the function of a sphincter muscle.

g is a portion of the *duodenum*, or first intestine.

h gives the place where the *biliary* and *pancreatic ducts* enter the *duodenum*.

i. A stilet is here supposed to be passed through that portion of the œsophagean canal (the very beginning of it), through which the gullet communicates with the paunch.

k. A stilet is here supposed to run through that part of the canal by means of which the gullet communicates with the second stomach.

l. A stilet here passes below the last, and under the œsophagean canal, showing the situation of the direct communication between the rumen and the reticulum.

m. The supposed direction of the œsophagean canal to the third stomach over the roofs of the paunch and the second stomach.

n. Its passage through the third stomach, and entrance into the fourth.

THE CHANGES OF THE FOOD IN THE DIFFERENT STOMACHS.

The ox rapidly and somewhat greedily crops the herbage, which undergoes little or no mastication, but, being rolled into a pellet, and, as it passes along the pharynx, being somewhat enveloped by the mucus there secreted, is swallowed. The pellet, being hard and rapidly driven along by the action of the muscles of the œsophagus, falls upon the anterior portion of the œsophagean canal, and its curiously-formed floor; and either by the force with which it strikes on these pillars, or by some instinctive influence, they are separated, and the pellet falls into the rumen, which is found immediately under the base of the gullet, as represented at *c*, p. 424, and *i*, p. 426. The food, however, which thus enters the rumen does not remain stationary in the place where it falls. It has been seen that the walls of this stomach are supplied with muscles of considerable power, and which run longitudinally and transversely, and in various directions all over it, and by means of them the contents of the paunch are gradually conveyed through all its compartments. At first the food travels with comparative rapidity, for the muscles of the stomach act strongly, and the papillæ with which it is lined easily yield and suffer it to pass on; but, the rumen being filled or the animal ceasing to graze, the progress of the food is retarded. The muscles act with less power, and the contents of the stomach with greater difficulty find their way over the partitions of the different sacs, and, at the same time, probably, the papillæ exert their erectile power, and oppose a new obstacle.

Some cruel experiments have been instituted in order to ascertain the nature of this muscular action of the coats of the rumen, so necessary to produce this revolution of the food through its compartments. A considerable opening was cut into the flank, immediately over the paunch, and a swinging or balancing motion of that stomach, both upwards and downwards, and forwards and backwards, was plainly seen.

The uses of the papillæ seem to be various; they support the weight of the superincumbent food, rough, unmasticated, and liable to injure the coat of the stomach over which it is continually moving; they take away the pressure from the follicular glands of the stomach, and which pressure

would render it impossible for these glands to discharge that mucous lubricating fluid, which is requisite for the protection of the stomach and the revolution of the food. The papillæ are consequently more numerous and larger and stronger at the centre or bottom of each of the compartments where the food would accumulate and press most, and they are more thinly scattered, and in some places almost disappear, where there is no danger from the pressure or the friction. In addition to all these, are the important functions of yielding and suffering the food to pass unimpeded along while the stomach is rapidly filling as the animal grazes, and then by their erectile power retarding that progress when the beast has ceased to eat, and the slow process of rumination has commenced. The glandular bodies, to which allusion has been made, are most plentifully situated, and are of largest size, on the upper part of the sides of the rumen, where they are least exposed to pressure, and may discharge the lubricating mucus which they secrete without obstacle.

The only change that takes place in the food in a healthy state and action of this stomach is that of maceration, and preparation for the second mastication, as may be easily proved by taking from the mouth of a cow a pellet that has been returned for rumination, and which will be found to be merely the grass, or other food, no otherwise altered than as being softened, and covered with a portion of mucus. The fluid which the rumen contains is not secreted there; but whenever the animal drinks, a portion of the water breaks through the pillars of the œsophagean canal, regulated in quantity either by the will of the beast, or by the sympathy of the parts with the state and wants of the stomach, or with the state of the constitution generally. The rumen of a healthy ox always contains a considerable quantity of fluid.

The food, having traversed all the compartments of this stomach, would arrive again at the point from which it started, were it not that a fold of the rumen arrests its course, and gives it a somewhat different direction. This fold is placed at the spot where there exists a communication between the rumen and the reticulum, and which also is guarded by a fold or valve; but the peristaltic motion of the stomach going on, and the food pressing from behind, a portion of it is at length, by a convulsive action, partly voluntary and partly involuntary, thrown over this fold into the reticulum.

The inner coat of the reticulum, or second stomach, has been described as divided into numerous honeycomb-formed cells (they are well represented at *d*, p. 426), at the base of each of which are numerous small secretory glands, which also furnish a considerable quantity of mucus. The action of this stomach consists in first contracting upon its contents; and, in doing this, it forms the portion just received from the rumen into the proper shape for its return up the œsophagus, and covers it more completely with mucus: then, by a stronger and somewhat spasmodic action, it forces the pellet between the pillars at the floor of the œsophagean canal, where it is seized by the muscles, that are so powerful at the base of the œsophagus, and which extend over this part of the canal, and is conveyed to the mouth. The reticulum, expanding again, receives a new portion of food from the rumen, and which had been forced over the valve by the convulsive action of that viscus.

It is curious to observe the manner in which these acts are performed. The cow is generally found couching on her right side, in order that the intestines which are principally lodged on that side may not press upon and interfere with the action of the rumen. After a pellet that has undergone the process of rumination is swallowed, there is a pause of two or three seconds,

during which the cow is making a slow and deep inspiration. By means of this the lungs are inflated and press on the diaphragm; and the diaphragm in its turn presses on both the rumen and the reticulum, and assists their action. Suddenly the inspiration is cut short by an evident spasm; it is the forcible ejection of the pellet from the reticulum, and of a fresh quantity of food over the valvular fold to enter the reticulum as soon as it expands again. This spasmodic action is immediately followed by the evident passage of the ball up the œsophagus to the mouth. The spiral muscles of the œsophagus, with their fibres interlacing each other, are admirably suited to assist the ascent as well as the descent of the pellet of food.

This prolonged inspiration is precisely the same as that to which the human being has recourse when he would expel a portion of the gas that distends his stomach.

This account of the construction and function of the rumen will throw considerable light on some circumstances not a little annoying to the practitioner. It has been stated that a portion of the fluid swallowed usually enters the rumen, and that the quantity which actually enters it depends a little perhaps on the will of the animal, more on the manner in which the fluid was administered, but most of all on some state of the constitution over which we have no control. Accordingly it happens, and not unfrequently, and particularly under some diseases of an inflammatory nature, and in which physic is imperatively required, that although it is administered in a liquid form and as gently as possible, the greater part, or the whole of it enters the rumen, and remains there totally inert. Dose after dose is administered until the practitioner is tired, or afraid to give more; and, ignorant of the anatomy and functions of the stomachs, he wonders at the obstinate constipation which seems to bid defiance to all purgative medicine; whereas, in fact, little or none of it had entered the intestinal canal. At length, perhaps, the rumen is excited to action, and ejects a considerable portion of its liquid, and some of its more solid contents, either directly into the œsophagean canal, or through the medium of the reticulum; and which, by an inverted and forcible contraction, is driven through the manyplus and into the fourth stomach, and thence into the intestinal canal, and produces sometimes natural, but at other times excessive and unmanageable and fatal purgation. The great quantity of fibrous substance, which occasionally is found in the dung, warns us that this has taken place.

Occasionally, when dose after dose has been given, and the animal dies apparently constipated, the whole of the physic is found in the rumen. These are difficulties in cattle practice which are not yet sufficiently understood.

When two or three moderate doses have been given, and purging is not produced, the practitioner may begin to suspect that the medicine has fallen through this œsophagean fissure into the rumen; and then, although he does not quite discontinue the physic, he should principally endeavour to stimulate this cuticular, yet not quite insensible, stomach. He should lessen the quantity of the purgative, and he should double or treble that of the aromatic and stimulant; and, in many cases, he will thus succeed in producing an intestinal evacuation, the fibrous nature of which will prove the unnatural process by which it was effected*.

It was, perhaps, from observation of the occasional benefit derived

* Mr. Friend, V. S., of Walsall, has, in the 'Veterinarian' for 1833, some exceedingly valuable observations on the practice which he adopted in these annoying and puzzling circumstances.

from the administration of aromatics and stimulants, even in inflammatory cases, that the absurd and mischievous practice of giving them in every disease, and every state of disease, arose.

The reason and the propriety of the administration of cattle-medicine in a liquid form is hence evident. A ball, in consequence of its weight, and the forcible manner in which it is urged on by the muscles of the œsophagus, breaks through the floor of the œsophagean canal, and enters the rumen and is lost. A liquid, administered slowly and carefully, and trickling down the œsophagus without the possibility of the muscles of that tube acting upon it and increasing its momentum, is likely to glide over this singular floor, and enter the fourth stomach and the intestines. A hint may hence be derived with regard to the manner of administering a drink. If it is poured down bodily from a large vessel, as is generally done, it will probably fall on the canal with sufficient force partly, at least, to separate the pillars, and a portion of it will enter the rumen and be useless.

In the calf, fed entirely on its mother's milk, the rumen is in a manner useless, for all the food goes on to the fourth stomach. It is of a liquid form, and it is swallowed in small quantities, and with little force at each act of deglutition. The instinctive closure of the pillars—an act of organic life—(because the milk if suffered to fall into the rumen would be lost, or would undergo dangerous changes there)—has far more to do with the direction of the fluid than any mechanical effect resulting from the form of the aliment, or the force with which it descended the gullet. It is curious to observe the comparatively diminutive size of the rumen, and the development of the abomasum in the foetal calf.

THE SUBJECT OF RUMINATION, AND THE CHANGES OF THE FOOD RESUMED.

The food, being returned from the reticulum to the mouth, is there subjected to a second mastication, generally very leisurely performed, and which is continued until enough is ground not only to satisfy the cravings of hunger, but to fill the comparatively small true stomach and intestines of the animal; and then, if he is undisturbed, he usually falls asleep. The act of rumination is accompanied, or closely followed, by that of digestion, and requires a considerable concentration of vital power; and hence the appearance of tranquillity and sleepy pleasure which the countenance of the beast presents. Sometimes the process is carried on while the animal is standing, and especially if he is accustomed to, or fears, interruption; and the working ox, if he is not driven too fast, or has not too heavy a load behind him, will ruminate as he walks along. The rumen is rarely or never emptied; and probably the food, that is returned for rumination, is that which has been macerating in the stomach during many hours. The process of rumination is very easily interrupted. Anything that surprises or frightens the animal will have this effect: even the compelling of the couching beast to rise will suspend it; and it is sometimes a long while before the process is recommenced.

Some persons have had the curiosity to count the number of times that the jaws have moved in the act of grinding the pellet, and these have varied from thirty to forty, according to the time the animal had fasted, or his freedom from interruption; but the portion of food having been sufficiently comminuted, is at length swallowed a second time; and then either being of a softer consistence, or not being so violently driven down the gullet, or, by some instinctive influence, it passes over the floor of the canal, without separating the pillars, and enters the manyplus, or third stomach. This is represented at *b*, p. 423, and *m*, p. 426.

The manyplus presents an admirable provision for that perfect comminution of the food which is requisite in an animal destined to supply us with nutriment both when living and when dead. That which is quite ground down is permitted to pass on; but the leaves, that have been described as hanging from the roof, and floating close over the œsophagean canal, and armed with numerous hook-formed papillæ, seize upon every particle of fibre that remains, and draw it up between them, and file it down by means of the hard prominences on their surfaces and suffer it not to escape until it is reduced to a pulpy mass.

These three stomachs, then, are evidently designed for the preparation and comminution of the food before it enters the fourth stomach, in which the process of digestion may be said to commence, and where the food, already softened, is converted into a fluid called *chyme*. The villous coat of the abomasum abounds with small follicular glands, whence is secreted a liquid called the *gastric juice*, and which is the agent in producing this chyme. The change, in all probability, merely consists in the food being more perfectly dissolved, and converted into a semi-fluid homogeneous mass. This form it must of necessity assume before its nutritive matter can be separated. The solution being complete, or as much so as it can be rendered, the food passes through the *pyloric*, or lower orifice of the stomach, into the duodenum, or first intestine (g, p. 426), where its separation into the nutritive and innutritive portions is effected, and the former begins to be taken up, and carried into the system.

We are now prepared to enter into the consideration of the diseases of this complicated apparatus.

DISEASES OF THE RUMEN OR PAUNCH.

It has already been hinted that the cow, and particularly while she is in calf, is a greedy animal, and will not only choke herself by swallowing broken food, half masticated, or scarcely masticated at all, but will occasionally devour very strange things. Inflammation of the pericardium has not unfrequently been produced by wires from the riddles or sieves which the animal has demolished from mere wantonness, and from needles and large pins that she has picked up. Three very instructive cases of this were given in page 250.

This is particularly the case with the cattle of poor people and where the women and children live, as it were, among them.

SWALLOWING INDIGESTIBLE SUBSTANCES.

There are some singular records of this depraved appetite, if so it may be called. The museum of the veterinary school at Alfort contains a calculus that was taken from the rumen of an ox, and the nucleus, or central body, around which the vegetable and slimy matter gradually formed and hardened, was a woman's neckerchief, without one laceration in it. In the same museum is a pair of scissors, to which a cow had taken a fancy; and which had worked their way through the coats of the stomach, and at length begun to protrude between two of the ribs, whence they were extracted. It was necessary to break the rivet by which the blades were united, before their removal could be accomplished. Another cow swallowed a similar pair, but these were arrested in their passage down the throat, whence they penetrated into the thorax, and at length protruded between two of the ribs. An old shoe was found in the paunch of an ox; and the lash of a whip, with part of the handle attached to it, began to elevate the left flank of a cow and was extracted after an incision had been made upon it. An ox, destined to be slaughtered, was led to

the abattoir, where the man in attendance had taken off his waistcoat, and left it in the slaughter-house, from which he was called away for a few minutes. On his return the waistcoat was missing, and his companions were accused of the theft, or trick; but it was presently found in the paunch of the beast. A cow exhibited symptoms of choking, and was in extreme distress. There was evidently no obstructing body in the portion of the gullet above the thorax, nor could it be detected lower; yet the symptoms were those only which could be referred to the lodgment of some foreign body in the gullet, or the orifice of the stomach. A large incision was made in the left flank, sufficient for the admission of a man's hand; that incision was carried on into the rumen, and a buckskin glove was abstracted, that had been fixed between the pillars of the floor of the œsophagean canal, between which lies the entrance into the rumen*.

The presence of bodies like these in the rumen cannot fail of being injurious to the animal. They must produce local irritation, interfering with the proper function of this stomach; suspending the process of rumination, or rendering it less effectually performed; and exciting inflammation, probably of the stomach generally as this foreign body is traversing its different compartments, or of some particular portion in which it may be accidentally arrested, and leading on to abscess and perforation of the stomach at that spot. During the strange journey of these bodies through various parts of the frame, previous to their final expulsion, and while they are, as it were, seeking a way of escape, they cannot fail of producing much serious indisposition. The symptoms which would indicate this peculiar cause of disease are not yet sufficiently known; but there must be considerable disturbance when a body sufficiently hard and pointed thus to force its way commences its journey. Inflammation, as conducting to suppuration and destruction of the living substance, must precede its course and make way for it; and as it passes along, the aperture closes, and the wound is healed behind it. The nerves and blood-vessels which lie in its way are, with mysterious skill, unerringly avoided, and as little injury as possible is done to the neighbouring tissues; but local inflammation and pain attend the whole process, which, in many cases, are accompanied by general and severe disease.

It is seldom that medical skill could be of avail here, until the substance approaches to the skin, even if the case were understood. All that can be done is to prevent the animals, as much as possible, from having the opportunity of swallowing these things.

CONCRETIONS IN THE RUMEN.

A more frequent and a more serious complaint is the formation of various concretions in the rumen. They are generally round, but occasionally of various forms, and varying likewise in weight from a few ounces to six or seven pounds. The composition of these balls is also very different. Those which are decidedly peculiar to cattle are composed entirely of hair matted together by the mucous secretion from the follicular glands of the stomach. Sometimes they have no distinct central body; at other times it exists in the form of a bit of straw or wood, or frequently of stone or iron. They exist in the rumen, and in the abomasum. In the abomasum they are composed exclusively of hair, irregularly matted and held together by the mucus of the stomach; in the rumen there is generally a mixture of food, or earthy matter, in the composition of the concretion.

* Vide *Récueil de Médecine Vétérinaire*, 1830, p. 324. *Mémoires et Observations sur la Chirurgie et la Médecine Vétérinaires*, tome ii. p. 360, et *Dict. Vétérinaire*, par Hurltel d'Arboval, 'Corps Etrangers.'

When simple food mingles with the hair, the ball seems to be formed by a succession of concentric layers, and in the centre is a bit of nail or stone; or, if the beasts have access to running water, a piece of shell often constitutes the nucleus.

The hair is obtained by the habit which cattle, and even very young calves, have of licking each other. Two cows will sometimes stand for a long while titillating one another in this manner. A considerable quantity of hair is loosened and removed by the rough tongues of these animals, the greater part of which is swallowed; and there seems to be a kind of power in the stomach to separate these indigestible matters from the other substances which it contains. It is also easy to imagine that the hairs which the manyplus, with all its grinding power, cannot rub down, will collect together when floating in the semi-fluid contents of the fourth stomach, and gradually accumulate in considerable and hard masses.

These balls will begin to form at a very early age of the animal. Mr. Linton, of Bishop's Auckland, found a ball 'as large as his two fists,' in the rumen of a calf that was slaughtered, when only five weeks old. This calf, although it was made sufficiently fat for the butcher, was subject to distention of the rumen, and was always uneasy for the space of an hour after its milk had been given to it*.

When only a little hair enters into the formation of these calculi, they are usually made up of earthy matter, with bits of hay, straw, or other food, agglutinated together by the mucus of the stomach. These have uniformly a hard central nucleus, generally metallic. The concentric layers can here also be traced, but they are, occasionally, somewhat confused.

In some cases, but not so often as in the horse, more of the various compounds of lime, and still more of silicious matter, can be detected by chemical analysis. These concretions are round; they are seldom found except in the rumen, and never in the intestines; and there is always a central nucleus of stone or metal; the concentric layers are regularly and beautifully marked; and the concretion, when sawn asunder, will bear a high degree of polish.

Of the effect of these substances on the health of the animal it is difficult to speak. One thing, however, is certain, that they are often found and in greater numbers in those that are ailing and out of condition, than in stronger and thriving beasts; but whether some fault in the digestive organs, indicated by this poorness of condition, gives a tendency to the formation of concretions in the paunch, or the presence of these concretions impairs the digestive powers and produces general unthriftiness, are questions which it is difficult to answer. Each opinion may in its turn be true, but it is probable that the latter state of things oftenest occurs. However this may be decided, these calculi are not so injurious to cattle as to the horse, because they are, with few exceptions, confined to the stomach, where they may produce a sense of oppression and impairment of appetite, but cannot be the cause of that severe colic, and obstruction, and inflammation, and strangulation of the intestines which destroy so many horses.

DISTENTION OF THE RUMEN FROM FOOD

Cattle, when first put on succulent grass or turnips, or when suffered to gorge themselves with potatoes or grains, or even with chaff, will sometimes distend the rumen almost to bursting. The disease is recognised in

* Veterinarian, October, 1833.

town-dairies by the name of *grain-sick*; in some parts of the country it is termed *maw-bound*.

The history of the case will generally unfold the nature of it; and it will be distinguished from hoove from its not being attended by occasional eructation, by the swelling not being so great as in hoove, and by the hardness of the flanks. Should any doubt, however, remain, the probang should be passed into the rumen, when, if that is distended with gas, a sudden and violent rush of the imprisoned air will follow. The probang, however, should *always* be used, not only to determine this point, but the degree to which the rumen is distended by food.

When, although the animal may be dull, refusing to eat, and ceasing to ruminate, generally lying down and shewing great disinclination to move, yet the pulse is not materially quickened, and the muscle is cool and moist, and there is little heaving at the flanks, and no indication of pain, the practitioner may content himself with a free bleeding and a powerful dose of physic. These symptoms, however, are often treacherous, and, without warning, uneasiness and heaving, and stupor and death, may rapidly succeed. Some farmers place great reliance on *goose-grease*, which is carefully preserved to be used in this complaint; and, it is said, that one pound of it boiled in a quart of milk will give immediate relief. If it does give relief, it is because the goose-grease is an aperient; but a dose of olive or castor-oil would have answered the same purpose, without the danger of poisoning by the deleterious acid that is sometimes developed in this animal matter.

Mr. Parkinson strongly recommends his chamberley and salt, as an effectual remedy for *grain-sick*, which they may use who are not ashamed to administer so filthy a medicine. He, however, very properly adds, that "the beasts should be turned into the cow-stand or pasture, exercise being an essential in the cure of this complaint." In these milder cases, stimulants may also be resorted to with frequent advantage. Ammonia, ether, aromatics, and ardent spirits, have succeeded in rousing the stomach to action, and establishing the process of rumination; and that once established, there is little fear of the result of the case. These stimulants should, however, be always accompanied by aperient medicines.

When, however, the symptoms are sudden dulness, uneasiness, shifting of posture, moaning, swelling at the sides, the flank feeling hard and not yielding to pressure; when rumination ceases, and the uneasiness and moaning increase, and the animal gradually becomes unconscious, this is a most serious business, and will admit of no delay. It is a case that demands mechanical relief.

The practitioner will probably be able to obtain some account of the nature of the contents of the stomach, and the introduction of the probang will ascertain the degree of distention.

Should the probang enter a little way into the stomach, and the operator be able to move it about, he will have proof that, although the paunch is sufficiently distended to produce severe annoyance and considerable danger to the animal, it is not stretched to the utmost; and he will consider whether he may not first try the effect of mild measures, and he will be especially encouraged to attempt this if he finds that the food is of a rather light nature.

A case related by Mr. Cotcheifer, of Newark,* will best illustrate the method to be pursued. He was consulted respecting two cows that had gorged themselves with eating wheat-chaff, and one of which was already

dead. Mr. Cotcheifer, that he might lose no time, first administered a strong purging draught to the living one. He then proceeded to examine the dead cow; and finding that both the first and second stomachs were filled with this chaff, he immediately saw that he must have recourse to other means in order to remove this accumulated food. Reasoning upon the nature of the food, and the distention not being exceedingly violent, he sent home for Read's Stomach Pump, and, having passed the flexible tube into the paunch, he injected a considerable quantity of water. He then attempted to pump out some of the contents which he had thus softened, but he found this to be impracticable, from the lightness and half masticated state of the food, which soon stopped up the syringe; he therefore injected water into the rumen until it began to react upon its contents, and a considerable proportion of them were discharged by vomit. He afterwards threw up a large clyster of warm water, and ordered the cow to be drenched with it several times in the day, and to be moved gently about. The physic, assisted by the clyster, acted freely. On the following day, the cow was better, and she recovered; but it was a considerable time before she fully regained her appetite and condition.

If the probang cannot be introduced at all into the rumen, or the food eaten is heavy, as grains or potatoes or corn, the most judicious plan will be to make an incision without delay through the left flank into the rumen, and thus extract its contents.

A case, related by Mr. J. Steel, of Biggar, N. B.,* will form a useful commentary on the advice here given. He was sent for in haste to a cow that was supposed to be very much hoven, and that seemed to be dying. He found indeed every appearance of approaching dissolution. A surgeon had been prevailed on by the owner to puncture her with a trocar, but no air came away; and it was evident (as it would have been by examination with the probang) that the stomach was distended with food. She had been feeding on clover pasture. Mr. Steel, with a decision that did him credit, proposed an immediate opening into the stomach, and the mechanical removal of its contents. He was supported by the opinion of the surgeon; and the owner consented when he was assured that not a moment was to be lost.

Mr. S. made an incision, five inches in length, through the flank into the stomach. The contents immediately came rushing out in a large stream, and continued doing so for some time; and when it stopped coming of itself, he introduced his hand, and removed a great deal more of it; and he says that the quantity of this indigested mass that was taken out was almost incredible. He then stitched up the wound, abstracted some blood, and gave a purgative. Some days having elapsed, and the bowels not acting, and the cow not feeding, he examined the state of the rumen through the wound, some of the stitches having given way. He found that the portion of the food, which was not removed, was lying in large hard masses in the paunch. He was unwilling to open the whole of the wound afresh; but, with the point of a long syringe, he broke down these masses as well as he could, injected a good quantity of warm water, and gave a smart dose of physic, which acted briskly. On the next day, she was evidently better, and continued to improve; and, at length in spite of a severe catarrhal fever, which was brought on by an accidental cause, she perfectly recovered.

This mode of proceeding, however, is recommended only in cases of extreme distention with heavy food. The rumen of cattle, with few blood-vessels and nerves, will endure very severe treatment without serious

* Veterinarian, February, 1834.

injury. The principal danger is, and it exists to a considerable extent, that a portion of the food will, during the extrication of the rest from the stomach, fall into the abdomen, and there remain a source of irritation, and the unsuspected cause of serious and fatal disease when the fears of the owner had completely subsided.

A beast that has been subjected to this operation, or, indeed, whose paunch has been distended to any considerable degree, should be prepared for the butcher as soon as possible, or sold almost immediately, if in tolerable condition: for a stomach, whose muscular fibres have been so stretched and enfeebled, will not soon do its full duty again; or a small portion of food, which, notwithstanding the most careful management may fall into the belly, will sometimes, after a while, produce inflammation of the intestines, and death.

HOOVE, OR DISTENTION OF THE STOMACH FROM GAS.

If a beast, taken from poor or less nutritive food, is put upon clover, or turnips, or rich-fog, it eats so greedily and so much, that the rumen ceases to act. These green vegetable substances are naturally subject to fermentation, during which much gas is extricated, but when inclosed in the stomach and exposed to the combined influence of heat and moisture, the commencement of the fermentation is hastened, and its effect increased.

The "Hoove" or "Blown" is distention of the rumen, by gas extricated from substances undergoing the process of fermentation within it. In a healthy discharge of the functions of the stomach, the food simply undergoes a process of maceration or softening; but if the food is retained in the stomach longer than the usual period, it, or perhaps only a portion of the juices which it contains, begins to ferment; or, as in animals with simple stomachs, even this preparatory one may so sympathise with certain states of the constitution, as either to secrete an acid principle, or to favour the development of it in the food. It is from this cause that some degree of hoove accompanies most fevers; it has been seen that it is the consequence of general irritation produced by obstruction of the œsophagus; and it sometimes accompanies difficult parturition, and to such an extent, that it is necessary to puncture the rumen before the calf can descend sufficiently low into the pelvis to be extracted.

Its most frequent cause, however, is that which has been just stated, namely, the turning of a beast from poor, or less nutritious food, into plentiful and luxuriant pasture, when he frequently eats so greedily, and so much, that the stomach is overloaded, and is unable to circulate the food through its cavities, and from the combined action of heat and moisture its contents speedily ferment, and gas is extricated. The following are the symptoms:—

The animal gradually becomes oppressed and distressed. It ceases to eat; it does not ruminate; it scarcely moves; but it stands with its head extended, breathing heavily, and moaning. The whole belly is blown up: this is particularly evident at the flanks and most of all at the left flank, for under that the posterior division of the rumen lies. When the effects of this distention of the stomach in the horse were described, a determination of blood to the head was spoken of as an early and a fearful symptom. Many blood-vessels go to the stomach of the horse, and it is richly supplied with nervous influence, therefore the brain soon sympathises with this overloaded organ, and *staggers* are produced. It has been shown, however, that the rumen in cattle is scantily supplied with either blood-vessels or nerves, and therefore the brain is seldom much affected in an early stage of hoove. Swelling, unwillingness to

move, and laborious breathing, are the first and distinguishing symptoms. In proportion as the stomach becomes distended by the extricated gas, the case becomes more desperate, not only from the pressure on the other contents of the abdomen, thus impeding the circulation of the blood; and also on the diaphragm, against which the rumen abuts, and thus impeding respiration, and also the danger of rupture of the paunch, but the construction of the œsophagean canal renders it manifest that the rumen will be more obstinately closed in proportion as it is distended. It is the relaxation of the muscular fibres which causes the two pillars that constitute the floor of the canal and the roof of the rumen to be easily opened, either for the admission or the return of food; but when the stomach is filled and elongated, as well as widened, these fleshy pillars must be stretched, and in proportion as they are distended, will they be brought closer to each other, and firmly held there. Two cords, tied together at the ends, may be easily separated from each other in the centre, when they are loosely held; but if they are tightly stretched, they are brought close together, and the difficulty of separating them increases with the tension.

This every-day illustration may explain the seeming difficulty of the rumen becoming thus dangerously distended, with these moveable pillars in its roof. When the rumen is filling, there are occasional eructations of a sour or fœtid character; but when the stomach is once filled, there is no longer the possibility of escape for its contents.

The animal cannot long sustain this derangement of important parts; inflammation is set up, and the circulation becomes seriously and dangerously disturbed by this partial obstruction. Affection of the brain comes at last, characterised by fulness of the vessels, hardness of the pulse, redness of the conjunctiva, and protrusion of the eye. The tongue hangs from the mouth, and the mouth is filled with spume. The beast stands with his back bent, his legs as much as possible under him; and he gradually becomes insensible—immoveable—he moans—falls—struggles with some violence, and, as death approaches, some relaxation of the parts ensues, and a quantity of green sour liquid, occasionally mixed with more solid food, flows from the mouth and nose.

There can be no dispute as to the first object to be accomplished, in order to save the animal; the gas must be liberated, or otherwise got rid of. Some persons, when symptoms of hoove appear, drive the animal about, and keep him for a while in constant motion. This is particularly the case with sheep. It is supposed, that in the motion of all the contents of the abdomen, while the animal is moving briskly about, the pillars of the roof of the paunch must be for a moment relaxed, and opportunity given for the gas to escape into the œsophagean canal, and through the gullet; and this will, undoubtedly, be the case to a certain degree. In sheep, that can be more easily driven about than oxen, this is sometimes effectual; but the ox cannot without much difficulty, and often not at all, be induced to move with rapidity, which is necessary to produce concussions sufficiently powerful to shorten and disunite the muscular pillars. There must also be some danger of rupturing the stomach so much distended, or the diaphragm, against which it is pressing, by the very production of these concussions.

In some parts of Leicestershire, the farmers still retain the old method of very effectually producing these shocks: pails-full of cold water are thrown one after another on the beast. A violent eructation follows, and the animal is relieved; but it unfortunately happens that the stomach now and then gives way, instead of the pillars of the œsophagean canal and the patient is lost.

Some writers recommend the administration of vinegar, the propriety of which admits of much doubt, for the fluid contained in the stomach is already sufficiently acid.

Others have recommended alkalis, and described them as almost a specific. Ammonia has been extolled as seldom failing to give relief. It may be conceded, that the alkali would be likely to neutralise the acid contents of the stomach; but there is one objection to it, (another will be stated presently,) viz., that the same closing of the roof of the rumen, which prevents the escape of the gas, would also prevent the entrance of the alkali, which would, consequently, pass on to the third and fourth stomachs, where there is no acid for it to neutralise.

Oil (whether olive, or spermaceti, or castor, or common whale oil, seems to be a matter of indifference) will sometimes prove serviceable in cases of hoove; but it is either at the very commencement, before the muscular pillars are tightened, and when a portion of it can enter the paunch, and produce a disposition to vomiting or purging; or, if the whole passes on into the fourth stomach, and so into the intestinal canal, a sympathetic but inverted action is excited in the rumen, and a portion of its contents is sent, by an unusual passage, from the rumen through the third and into the fourth stomach, and so relief is obtained. In this way purging is occasionally established, either in consequence of a stimulus applied immediately to the coats of the first stomach, or from sympathy with the action going forward in the intestinal canal, a portion of the food is carried from the rumen into the intestines without being returned to the mouth to be remasticated. The grassy and harder fibres, sometimes found in the dung in considerable quantities, prove that that portion of it could not have undergone rumination. This, however, is not striking at the root of the evil.

The object to be accomplished is the extrication of the gas, and the prevention of any fresh quantity of it being developed. If the farmer or the practitioner, at a distance from home, sees any of his cattle so dangerously hoven or swelled as to threaten speedy death, he adopts a summary mode of getting rid of the gas: he takes a sharp-pointed knife, and plunges it into the left flank, underneath, and in contact with which the rumen is found. The gas rushes violently through the aperture, carrying with it steam, and fluid, and pieces of food. The belly falls, and the beast is immediately relieved. The safest place for this operation is the following:—Supposing a line to be drawn close along the vertebræ, from the haunch-bone to the last rib, and two other lines of equal length to extend down the flank, so as to form an equilateral triangle, the apex of the triangle, or the point where these lines would meet, would be the proper place for the operation, for there is no danger of wounding either the spleen or the kidney.

It may also be suggested, that a small trocar is far preferable to a knife for this operation, and might very conveniently be carried in the instrument-case of the surgeon, or the pocket of the farmer. It consists of a short strong stilet, terminating in three cutting edges converging to a point, and having a handle that may be grasped with some force. To this is accurately fitted a silver canula or tube, reaching from the termination of the three edges to the handle. It is, in fact, the instrument used by human surgeons in tapping for dropsy. This is plunged into the flank; the stilet is then withdrawn, and the canula remains as long as the operator pleases, and may be secured by tapes attached to two rings at the base of it, and tied round the body of the animal.

The gas is certainly extricated in this way, and generally successfully

so. When gas ceases to escape, it may be taken for granted that the manufacture of it has ceased in the rumen; the trocar may then be withdrawn, and the wound will speedily heal. There are, however, occasional bad consequences, which are altogether unsuspected by the farmer or the practitioner. At the commencement of the operation, when the inside of the flank is in close contact with the paunch, the gas, fluid, and fibrous matter will all be safely thrown out through the two wounds, for, lying upon each other, they are but as one; but when the stomach is partially emptied of the gas, it sinks, and is no longer in contact with the parietes of the abdomen. The gas and particles of solid food continue to be discharged for a considerable time after this; and although the greater part may be ejected with sufficient force to be driven through the aperture in the flank, yet some portion will necessarily fall into the abdomen and remain there. This will, ere long, become a source of considerable and dangerous irritation; slow or rapid in its progress and effects, according to the quantity of food that has escaped from the stomach into the abdominal cavity. accordingly it happens, that although the beast may appear to be perfectly relieved by this operation, he does not thrive well afterwards, and, in the course of a few weeks or months, sickens and dies of some obscure disease, but which is principally referrible to inflammatory affection of the abdomen. Therefore, the farmer or practitioner who has faith in and occasional recourse to the mode of cure by puncturing the rumen should always carry a trocar with him, for the canula penetrating three or four inches into the abdomen would form a continuous passage between the rumen and the flanks, notwithstanding the subsidence of the former, and would prevent the escape of any portion of the contents of the rumen into the abdomen.

Although a portion of the gas may be liberated by this operation, yet the process of fermentation may proceed. The gas may escape, but that which would furnish a long, continued, and annoying and dangerous supply of it remains. Then the advocates for paunching carry their operation a little farther. They enlarge the aperture into the paunch, until, as in bad cases of maw-bound, they can introduce their hand, and shovel out the contents; and, as before stated, the stomach, from its comparative insensibility, and want of vitality, bears all this without any considerable inflammation or danger; there is, however, as in the simple paunching, danger from the escape of a portion of the contents into the cavity of the abdomen.

This larger opening into the rumen should never be attempted except by a veterinary surgeon, or a person perfectly acquainted with the anatomy of cattle, and the precise situation of the viscera of the belly. A cow had eaten a great quantity of lucern, and was hoven. A neighbour, who was supposed to know a great deal about cattle, made this large incision into the paunch: the gas escaped, a great portion of the food was removed, and the animal appeared to be considerably relieved, but rumination did not return, and on the following day the animal was dull—she refused her food, but was eager for drink—she became worse and worse—and, on the sixth day, she died. She was examined after death; and one of the kidneys was found to be punctured, and the peritoneum in the neighbourhood of the wound was black with inflammation.

The French Practical Journal of Veterinary Medicine (for 1829, p. 390) contains a case in which the cow was destroyed by the operation, although the larger opening was not resorted to, and even a rude kind of canula was used. A cow that was hoven was punctured by the shepherd with his knife. The gas escaped, and the animal was relieved; but whether the man

had made the opening into the rumen too large, or had irritated the wound by holding it open with his fingers, while some one procured a hollow piece of elder to be introduced as a canula into it, the cow was evidently ill on the following day, and became rapidly worse, and exhibited symptoms of inflammation of the bowels, and, on the seventh day after the puncturing, was so bad, that she was destroyed. Several gallons of fluid were found in the belly, with a considerable quantity of half-chewed food swimming in it: many portions of the small intestines were highly inflamed, and the peritoneum generally was so, and particularly in the neighbourhood of the wound.

It was the knowledge of facts like these, (and similar ones must have occurred in the experience of every practitioner,) that produced the conviction that the practice of puncturing the rumen was not so simple and so free from danger as some had imagined, and led to the invention and use of the *probang* and *stomach-pump*. The tube (fig. 1, *a.* p. 417) is introduced into the mouth, and is passed down the throat, with the rounded extremity, *e*, downwards, and is forced on through the pillars of the œsophagean canal: the stilet is then withdrawn, and the gas rushes violently out. The tube is continued in the mouth until the belly sinks, and little gas escapes: the animal is greatly relieved, and if it begins to swell again, the probang is once more introduced. But the tube cannot remain in the mouth and gullet for any great length of time; and when it is withdrawn, the manufacture of gas may continue undiminished, and the relief be only temporary, and so far the probang may be in some degree inferior to the trocar.

The practitioner then has recourse to the stomach-pump, and he throws in a considerable quantity of warm water, and pumps it out again; and repeats the operation until he has washed away all the acid fermenting fluid, and then usually the process of rumination recommences, and the animal does well. Sometimes he so overcharges the stomach that vomiting is produced, and a great portion of the contents of the rumen is thus discharged.

Hoove, however, had long been considered to be a case in which the aid of chemistry might be resorted to with considerable benefit; and alkalis were thrown into the stomach to neutralise the supposed acid principle which then prevailed. The carbonate of ammonia was a favourite medicine for this purpose; but they who were deluded by this supposed application of chemistry, forgot that the necessary consequence of the combination of the alkali with the acid would be the extrication of an immense volume of gas, of a different nature indeed, but which would still more distend the rumen, and that even to bursting. As, however, a very small portion of it, if any, enters the rumen, it will principally do good, and much good it frequently does effect by its stimulant effect on the fourth stomach, propagated by sympathy to the first.

Acids are resorted to by other practitioners, but it would be difficult to say on what principle, except their stimulant effect on the rumen, and thus rousing it to contract, if possible, upon, and expel its contents. More powerful stimulants than the acids are with great propriety adopted by another set of practitioners, and peppermint, wine, and even ardent spirits are freely administered, and in many cases with beneficial effect, and especially when they can be got into the rumen.

At length it occurred to some inquiring men to turn their chemistry to better account by an analysis of the gas that was so rapidly and abundantly extricated, and the extrication of which was the source of all the mischief. It had been suspected that it consisted principally of hydrogen;

for when a lighted candle had been accidentally brought into contact with the vapour as it rushed from the aperture in the flank, the gas immediately caught fire. Careful analysis indicated that the gas was differently combined, in different stages. In recent hoove it consisted chiefly of carburated hydrogen—the union of carbon with hydrogen; in more chronic cases there was a mixture of sulphuretted hydrogen—the union of sulphur and hydrogen; and, in proportion to the continuance of the hoove, the sulphuretted hydrogen increased, and at length prevailed. In both cases hydrogen was the chief constituent.

Then came the inquiry, whether something might not be introduced into the stomach which would combine with the gas already extricated, and cause it to disappear, and also prevent its future accumulation, by combining with it as soon as it was produced. Chlorine suggested itself to the mind of the inquirer, between which and hydrogen a very strong affinity prevailed, and which rapidly combined with hydrogen, and formed muriatic gas, while this new and compound gas was immediately absorbed by water, and became muriatic acid.

There were, however, some obvious difficulties attached to the administration of chlorine; for, in the form of gas, it is destructive to life, and, even when combined with water, it produces speedy and dangerous inflammation of the stomach and bowels. The muriatic acid also—the result of the combination of the chlorine and the hydrogen and water—was not a very harmless thing in the stomach of the horse, or of cattle.

A method, nevertheless, was soon discovered, by which it might be administered with perfect safety and admirable result. Chlorine had affinity for various substances, as lime, potash, and soda; and its combination with either of these could be substituted for the unmanageable and destructive chlorine. When introduced by means of the stomach-pump into the rumen, the chlorine would separate itself from the alkali, and combine with the hydrogen, for which it had a more powerful affinity, and formed muriatic gas. This gas had a strong affinity for water, and would be quickly absorbed by the fluid always contained within the stomach; and so, quitting its gaseous for a fluid form, it quickly disappeared, or would not retain a thousandth part of its former bulk, and muriatic acid would be formed. At the same time, the lime or potash, or soda, (according to the combination that was used,) would be liberated; yet no danger would result from the presence of this corroding acid and caustic alkali; for there was a chemical affinity between them which would be soon exerted, and the harmless and inert muriates of lime or potash, or soda, would be produced. This was not mere theory, but when brought to the test of practice, was verified in every particular; and hence resulted one of the most important improvements in cattle-medicine that modern times have produced.

The chloride of lime is as good as either of the others, and should always be in the possession of the farmer and practitioner, not only for this purpose, but because, in cases of foul, foetid ulceration, and gangrene generally, it is the most powerful disinfectant, and the most useful stimulant that can be applied. The proper and safe dose is two drachms of the powdered chloride of lime dissolved in two quarts of water, and injected into the paunch by means of the stomach-pump. This may be repeated an hour afterwards, if circumstances should appear to require it.

The trocar will then supersede the use of the knife and the lancet, when, under circumstances of emergency, the practitioner may be compelled to act promptly; for, by the continuance of the canula in the wound, some of the distant and unsuspected results of the common method

of puncturing the rumen may be avoided ; but when the practitioner is near home, or can obtain speedy access to his stomach-tube and pump, the trocar will be completely discarded.

The animal having been relieved, and the gas ceasing to distend the paunch, a pound of Epsom salts should be administered with an ounce of carraway powder, and half an ounce of ginger ; and, on several successive mornings, four ounces of Epsom salts, two of powdered gentian, and half an ounce of ginger, should be given. The object of the practitioner, or the owner, should be to restore, as speedily and as effectually as possible, the tone and action of the rumen. The return of the process of rumination will show when that is beginning to be effected, and rumination will usually precede the desire to eat.

Attention should for some time be paid to the manner of feeding. A mash should be daily allowed, and the pasture on which the beast is turned should be short and bare, rather than luxuriant. It should also be kept in mind that the over-distended stomach of the hoven beast will not soon, and in most cases will never, quite recover its former energy ; and that, if the beast is in tolerable condition, it should be sent to the butcher, or it should be got ready for the market as quickly as that can with safety be effected.

One of the most singular cases of hoove that we have on record is contained in one of the French periodicals *. A cow that had been turned into the pasture in perfect health, was found, in the course of the morning, labouring under great excitation, making frequent and violent efforts to vomit, and then galloping over the field with her mouth half open, and the saliva running from it as if she were mad. The eyes were haggard and fixed, and starting from their orbits, and the nostrils were unusually dilated. When she stood still her back was bowed, but presently she would stretch herself out, and bound away over the field. Her paunch began speedily to swell, and she moaned dreadfully, and could not be still for a moment.

The practitioner, not having a trocar, punctured the rumen with a bistoury. A vast quantity of gas rushed violently out ; the enlargement of the abdomen subsided, and she appeared to be perfectly at ease ; but presently the efforts to vomit recommenced, and the aperture into the paunch being accidentally closed, she began rapidly to swell again. The practitioner now suspected that the cause of all this mischief was concealed somewhere in the gullet, or the entrance into the first stomach. He carefully examined along the whole extent of gullet in the neck, but could not detect any obstruction. He then opened the mouth, and raised the head, in order to introduce a flexible osier rod into the gullet, when the animal again making a sudden and more violent effort to vomit, he saw the tail of a snake in the posterior part of the mouth. He seized it immediately with his right hand, and, steadying himself by laying firm hold of the horn with his left hand, he drew it out : it was dead, and measured three feet and eleven inches in length. There was no appearance of bite or wound upon it, but it was covered with a greenish spume. The efforts to vomit immediately ceased, the hoove disappeared, and the cow began to ruminate, and steadily regained her appetite and spirits.

Sucking calves are occasionally subject to hoove. Little more will be necessary in this case than the introduction of the probang. This distension of the rumen arises from some accidental and temporary cause, and there is rarely any continued manufacture of gas within the stomach.

* *Recueil de Méd. Vét.* 1826, p. 403.

Some calves become blown from the trick which they frequently have of sucking each other's pizzle or ear. It is curious to see with what eagerness they will do this, and how quickly they blow themselves up by the air which they draw in and swallow. The introduction of the probang will be sufficient here, but it will be prudent to separate the animals*.

LOSS OF CUD.

The cessation of rumination, designated by the term "the loss of cud," is more a symptom of disease, than a disease of itself. It accompanies most inflammatory complaints, and is often connected with those of debility. It will be the duty of the practitioner to ascertain the cause of this suspension of second mastication, and to adapt his mode of treatment to the nature of that cause. A dose of physic, with a very small portion of aromatic medicine, will be indicated if any fever can be detected; more than the usual quantity of the aromatic will be added in the absence of fever, and still more, with tonic and alterative medicine, if general debility is indicated. The carraway and ginger powder are the best aromatics that can be employed, and will supersede every other: the gentian and ginger, with Epsom salts, as recommended in p. 444, will prove a very useful tonic and alterative, in cases of "loss of cud" that cannot be traced to any particular diseased state of the animal, or that seems to be connected with general debility.

INFLAMMATION OF THE RUMEN.

In almost every book on cattle-medicine mention is made of "inflammation of the stomach;" and certainly cases do, although but rarely, occur in which evident traces of inflammation of the rumen may be discovered on examination after death. The cuticular coat is not discoloured, but it peels from the mucous coat below at the slightest touch, and that coat is red and injected. This is particularly the case when a beast dies soon after apparent recovery from distention of the stomach by gas, or when he is destroyed by the accumulation of solid food that could not be removed. It is likewise found in every case of poisoning, but the symptoms during life are so obscure that it would be useless to bestow further time on the consideration of this disease.

POISONS.

Nature has endowed the brute with an acuteness of the various senses, and with a degree of instinct which, so far as the life and enjoyment and usefulness of the animal are concerned, fully compensate for the lack of the intelligence of the human being. The quadruped is scarcely born ere

* It is amusing to observe the strange notions which some persons have formed of his disease and its treatment. Mr. Parkinson contends that it chiefly arises from the glands of the mouth being over-abundantly supplied with saliva, which, passing continually down the throat, the stomach becomes too full, and the end of the gullet or windpipe is stopped, so as to prevent the passage of the wind or breath. (What strange activity of the salivary glands, even to fill the enormous cavity of the rumen, and to stop the end of the gullet or windpipe! Excellent anatomy! The mode of cure is worthy of it.)

'I am convinced it is solely occasioned by a too abundant flow of saliva in the stomach. I have myself been much troubled with this complaint, for which, after trying many things prescribed by the faculty, I found an effectual remedy in smoking tobacco. This I do immediately after every meal, spitting as much as possible. Any stick with a knob thrust down the throat will give ease; but I much approve of tar being administered, as, from its nauseous quality, it will cause the animal to throw up much saliva—I have known them to discharge as much as a quart at a time—and affords an effectual and immediate relief.'—Parkinson's *Treatise on Live Stock*, vol. i. p. 238.

he is mysteriously guided, and without any of the lessons of experience, to the kind of food which affords him the most suitable nourishment, and he is warned from that which would be deleterious. There is scarcely a pasture which does not contain some poisonous plants, yet the beast crops the grass close around them without gathering a particle of that which would be injurious. In the spring of the year, however, and especially after they have been kept in the stall or the straw-yard during the winter, and supported chiefly on dry food, as soon as they are turned into the fields cattle eat greedily of every herb that presents itself, and frequently are seriously diseased, and sometimes quite poisoned. They are under the influence of appetite almost ungovernable, and few plants have then acquired their distinguishing form and colour, and taste and smell. It has already been stated (p. 310) that when Linnæus visited Tornea, the inhabitants complained of a disease which destroyed many of their cattle, and especially if, during the spring, they were turned into a particular meadow in the neighbourhood. He soon traced the disorder to the water-hemlock, which grew plentifully in that place, and which the cattle in spring did not know how to avoid*. The common and water-hemlock, the water-dropwort, and the yew, are the principal plants that are poisonous to cattle; but it is said that the common-crowfoot, and various others of the ranunculus family, are occasionally destructive. The writer of this treatise recollects losing one cow that had fed on the wild parsnip, and another by black henbane; and there is a case on record in which eight cows were poisoned by the stalks of the wild poppy.†

The symptoms of poisoning by these acrid and narcotic plants are obscure, unless they can be connected with the history of the case. They are principally sudden swelling, with a peculiar stupor, in the early stage of the attack; cessation of rumination; a change in the quality of the milk, which becomes thin and serous, and presently ceases to be secreted; the refusal of all solid food, and eagerness after water; quickening of the pulse, which yet becomes small, and, in some cases, scarcely to be felt; and the animal frequently grinds his teeth, and paws, and rolls, as if it felt severe colic pains. In a few instances the stupor passes over, and a degree of excitement and blind fury succeeds, which has been mistaken for madness.

On examination after death, the greater part of the poison is usually found in the paunch, but, in a few cases, it has been remasticated, and conveyed into the fourth stomach and intestines. The sense of taste does not seem to be very acute in cattle; it is a sleepy kind of pleasure which they feel in rumination, and the acrid and bitter flavour of many a plant appears to give them little annoyance.

Inflammation is found in the paunch and second stomach characterised by the ease with which the cuticular coat is separated from that beneath. The manyplus is usually filled with dry and hardened food; and the fourth stomach and intestines exhibit inflammation and ulceration proportioned to the acrimony of the poison, and the quantity of it which had passed into these viscera.

The yew is probably the most destructive poison, especially when a quantity of it is taken unmixed with other food. M. Husard, however, relates that, in Hanover and Hesse, the cattle are partly fed on the leaves of the yew. He examined the trees as they grew in the mountains of those countries, and he found them to be the true yew. In winter, and

* *Lachesis Laponica*, vol. ii. p. 136.

† *Recueil de Méd. Vétérinaire*, Oct. 1829, p. 99.

especially when fodder is more than usually scarce, a portion of yew leaves and branches is mingled with the other food. The quantity of the yew is small at first, but it is gradually increased until it constitutes the greater part of the food; and it has the reputation of materially contributing to the fattening of the beast.

The inhabitants of Hanover and Hesse are, nevertheless, perfectly aware of the poisonous property of the leaves of this tree, and are sometimes taught, by dear experience, that it will destroy their cattle, unless it is managed with this degree of caution.

M. Husard adds, that on his return to France he determined to put this matter to the test, but he selected the horse instead of cattle as the subject of his experiment. He gave the yew mixed with oats in the proportion of half a pound of the former to a pound and a half of the latter, and the horse did not appear to be in the slightest degree inconvenienced by what he had eaten.

This animal, however, was enfeebled and emaciated previous to the experiment; and it occurred to M. Husard that there might be a deficiency of sensibility in the stomach, and in the frame generally, and that, in consequence of this, the poison might not produce its fatal effects: he, therefore, selected a mare in good health and condition, as the subject of a second experiment. She ate the mingled yew and oats, and suffered no inconvenience.

He selected another horse as the subject of a third and decisive experiment. He took seven ounces of the yew, and bruised and mixed it with twelve ounces of water, so as to make a kind of electuary, which he gave to a horse that had fasted four hours; an hour afterwards he fell and died*.

The British agriculturist will scarcely be tempted to make experiments like these, except in times of the greatest scarcity, and then he would act with all the caution of the Hanoverian, for several instances occur to the recollection of the writer in which the presence of a considerable quantity of other food in the rumen did not preserve the beast from the fatal effects of the yew. Fortunately, it is seldom that cattle browse upon the green yew; the mischief is usually done by the half-dried clippings of the yew-trees, or hedges, which are too often suffered to lie in the way of cattle, and which they will eat, if not with avidity, yet freely.

Little can be done in the way of medicine when cattle have browsed on these poisonous plants, and the only hope of the practitioner must be founded on the early and persevering use of the stomach-pump. Plenty of warm water should be injected and pumped out, and that repeated again and again; and at length the stomach should be fully distended with water, for the purpose, and in the hope of, producing vomiting, as in Mr. Cotcheifer's case. Whether this succeeds or not, a brisk purgative should be next administered, but as cautiously and gently as possible, that it may pass on over the closed floor of the œsophagean canal into the fourth stomach, and not, by the power with which it descends, force open the pillars that compose that floor, and enter the rumen and be lost. Tonics and aromatics will here also follow the evacuation of the stomach, in order to restore its tone.

While speaking of poisons, it will, perhaps, be proper to mention that cattle are sometimes exposed to extreme danger from the application of deleterious mineral preparations for the cure of mange and other cutaneous eruptions. A practitioner had been attending on some mangy cows; he had applied the usual preparation of sulphur mixed with a portion of

* Instructions sur les Maladies de les Animaux Domestiques, tome vi. p. 300.

mercurial ointment, and the animals were decidedly getting better, although not so rapidly as the impatient owner desired. The gentleman became dissatisfied, and another person was called in, who freely applied a lotion to the sore and mangy spots; but before he had dressed the last of the cows, the first became suddenly and violently ill, and died. The former practitioner was sent for in great haste, but ere he had arrived, three had died, and he came just in time to witness the death of a fourth. They were all dead in less than two hours after the external application of the lotion. He found the bottle with a portion of the lotion remaining in it, which he carried away, and appointed the following morning for the opening of the animals, to which he desired that the second man should be summoned, and arriving at his home, he set to work to analyze the contents of the bottle. Combined with some unknown vegetable matter, he found a nearly saturated solution of corrosive sublimate. On the following morning the post-mortem examination took place. Considerable inflammation of the first and second stomachs was found, evidenced by the ready separation of the cuticular coat; the fourth stomach and the intestines were ulcerated, and in many places nearly perforated. The gas which proceeded from the abdomen and rumen was of so poisonous a character that the butcher who opened the animals, although warned of his danger, yet exposing himself to the blast of the gas as it escaped, had erysipelatous swelling of the face and head, which threatened his life. The cows were poisoned by the application of the mercurial wash to the mangy and abraded spots.

It is no unusual thing for cattle that have been incautiously dressed with a strong solution of corrosive sublimate to become seriously ill. They cease to eat and to ruminate; the saliva drivels from their mouths; they paw with their feet; look anxiously at their flanks, and are violently purged—blood usually mingling with the fæces.

The remedy, if there is time and opportunity to have recourse to it, is the white of several eggs, beaten up with thick gruel, and gently poured down the throat, that it may be more likely to pass on to the fourth stomach; and this repeated every hour, until the animal is either relieved or dead. As soon as decided relief is obtained, a dose of physic should be given, and if any fever seems to be coming on, a few pounds of blood should be taken away.

It is scarcely possible that cattle should suffer from the poison of arsenic unless it is maliciously administered, for it ought not to enter into the composition of any medicine, or external application. The antidote would be lime-water, or chalk and water plentifully administered.

DISEASES OF THE RETICULUM

Of these, in the present state of knowledge of cattle-medicine, little can be said. Some of the foreign substances that are found in the rumen have been occasionally discovered in the reticulum, as pins, pieces of wire, nails, small stones, &c. They were, probably, ejected over the valve between the two stomachs, enveloped by, or attached to, the portion of food that was preparing for a second mastication. In the forcible contraction of the stomach, it has been severely wounded by these substances, and so much inflammation has ensued, that the animal has been lost. The following narrative, by M. Dupuy, director of the Veterinary School at Toulouse, which is almost exclusively devoted to the consideration of the diseases of cattle, will form a sufficient illustration of this. A bull, three years old, died after an illness of fourteen days. The symptoms scarcely extended beyond the peculiar heaving and short cough of hoove.

On examination, after death, it was found that the second stomach adhered to the diaphragm by a false membrane, which was clearly the consequence of intense inflammation of that stomach. The coats of the reticulum had been pierced, and in the aperture was a piece of iron wire, that had penetrated through the diaphragm and the pericardium, and entered the right ventricle of the heart. Within the diaphragm, and between it and the heart, was a sac containing nearly a pound of blood mingled with the liquid food usually contained in the second stomach.

The mischief had been of long standing, for the walls of the ventricle were become white and of a cartilaginous structure, and the ventricle itself was filled with coagulated blood deposited layer upon layer. The pericardium was contracted and adhered to the heart, and might almost be said to have disappeared. The lungs were emphysematous, and contained numerous encysted tubercles resembling hydatids, or actually being so.

The writer of this treatise has frequently seen inflammation of the second stomach—sometimes accompanying that of the paunch, and at other times seemingly confined to the reticulum. This inflammation was, as in the rumen, characterised by the peeling off of the cuticular coat, and the redness of the tissue beneath it; but the symptoms were so different in different cases, and always so obscure, that no legitimate conclusion could be drawn from the appearances that presented themselves.

DISEASES OF THE MANYPLUS, OR MANIFOLDS.

Although the function of this stomach is one of a purely mechanical nature, there seems to be a strong bond of sympathy between it and almost every part of the frame. There are few serious diseases by which cattle are afflicted, and there are none of an acute and inflammatory nature, in which the manyplus is not involved. It is so common in cases of catarrh, constipation, inflammation of the lungs or bowels, simple fever, dropping after calving, blain, and even murrain, to find the manyplus either choked with food in a hardened state, or, if continuing soft, yet having become exceedingly putrid and emitting a most nauseous smell, that the idea of the animal being *fardel-bound*, or having disease of the *faik* is always present in the mind of the farmer and the country-practitioner. They are seldom wrong in this surmise, for the fardel-bag either sympathises with the diseases of other parts, or is the original seat and focus of disease.

The manyplus has been described as containing numerous leaves or curtains or duplicatures of its cuticular coat, and with interposed layers of muscular and vascular tissue, which hang from its roof and float loose in its cavity. These leaves are covered with innumerable little hard papillæ or prominences; and many of these, and especially toward the lower edges, assume a greater degree of bulk, and something of a hook-like form. Those portions of food that are returned after the second mastication, and that have not been thoroughly ground down, are seized by these hooked edges of the leaves and drawn up between them, and there retained until, by the action of these flexible grindstones, they are sufficiently comminuted for the purpose of digestion.

It is easy to imagine that, either sharing in the irritability of other parts, or being the original seat of irritation and inflammation, the manyplus may spasmodically contract upon, and forcibly detain the substances that have been thus taken up between its leaves. By this contraction the natural moisture of the food, or that which it had acquired in the processes of maceration and mastication, is mechanically squeezed out, or drained

away by the very position of the leaves, and a hard and dry mass necessarily remains. When the contraction is violent, and this imprisonment of the food long continued, we can even conceive of the possibility of its becoming so hardened and dry as to be snapped between the fingers, and to be capable of being reduced to powder. The description of it is not exaggerated when it is said to "look as if it had been baked in an oven." On the other hand, it can as readily be imagined that, either debilitated by inflammatory action peculiar to itself, or sympathising with, and sharing in the debility of other parts, the leaves may have lost the power of acting on the food contained between them, and which, supported by the irregularities of the cuticular coat, and imprisoned there in a somewhat pultaceous form, will gradually become putrid and offensive.

A third case may not unfrequently happen. The animal may be fed on too dry and fibrous matter, or he may lazily and but half perform the process of rumination; in consequence of this the hard parts of the food may accumulate in the manyplus more rapidly than they can be ground down, and so the stomach may become clogged and its function suspended. Whatever may be the cause, this state of contraction or inaction of the manyplus often occurs, and either aggravates the pre-existing malady, or becomes a new source of disease, and hastens or causes the death of the animal.

When this stomach has been spasmodically contracted, or long and forcibly distended, the imprisoned food presents a very curious appearance. There is an indentation of the papillæ on the surface of the detained mass. The impression is as perfect as could be made by any seal. All this force must have produced inflammation of the part; and that intense inflammation does occasionally exist in the manyplus, sufficient to produce great and general derangement and even to destroy the beast, is rendered sufficiently evident by the easy separation of the cuticular coat. In many cases, or perhaps in the majority of them, it is impossible to remove the detained mass from its situation without a portion of the cuticular coat accompanying and covering it. It must, however, be confessed, that even this hardened state of the contents of the manyplus is not always a proof of general disease. It is an unnatural and morbid state of the stomach, but very considerable local disease may exist in this organ, as it is known to do in many other parts, without materially, or in any appreciable degree, interfering with general health and good condition. Tubercles and abscesses in the lungs, and inflammation and almost complete disorganization of the liver, will occasionally be found on examination of the carcase, of the existence of which there was not the slightest suspicion during the life of the animal. So, in this case, the fardel-bag has been found choked with food, and that dry, and black, and roasted, and yet the beast had apparently been in perfect health.

The author of this treatise has seen the loss of function confined to one part only of this stomach. Between some of the leaves, or on one side or curvature of the manyplus, the contents have been green and fluid; in the other portion of it they have been perfectly baked. It is a wise and kind provision of nature that the general health and thriving of the animal shall in various cases be so little impaired by local, although serious, disease. Many a trifling circumstance, nevertheless, may cause this local evil to spread rapidly and widely; and, even without any additional excitement, the mere continuance of such a disease, accompanied by such derangement of function, can scarcely fail of being attended by injurious consequences. A very singular account, however, is recorded of the great length of time during which this hardened matter may be detained between the leaves of

the manyplus. A person at Bourbourg had a valuable cow that was fed principally on vetches. A serious epizootic broke out in that neighbourhood, and the cow was removed to a distant and uninfected place, where she remained for six weeks apparently well, and without the possibility of her getting at any vetches; she then became infected by this prevalent malady and died. The third stomach was filled with vetches, dry, hard, and, as it were, roasted. Although there was no apparent illness, it is impossible to determine how far this long-continued and unnatural state of the manyplus had preyed on the strength of her constitution, and prepared her for a fatal attack of the epidemic*.

In the *Veterinarian* for November, 1829, several cases of "staking" or "bound" are recorded by Mr. Cartwright, which were plainly referrible to this stomach. A drove of Anglesea cattle were on their journey to the London market. They appeared to be in perfect health when they crossed the ferry, and they stopped one night in a field near Bangor. They had not got far from this place when one of them was taken ill, and, being altogether unable to proceed, he was slaughtered. A little farther on two others began to fail; and when they arrived on the borders of Shropshire the disease was spreading rapidly among them. They were dull, moaning, they could scarcely be induced to move, and they remained obstinately standing. Proper measures were resorted to: they were bled and purgative medicine was administered, but four of them presently died. In two of these the manyplus was full,—clogged with food,—but it was soft; in the third, the greater part of the food was soft, but in the larger curvature it was hard and friable. In the fourth beast the manyplus was quite full and hard, each layer being so dried that it would snap short off; and upon each layer there was a thin pellicle of secretion of a blueish colour that could be easily separated; the leaves of the stomach were of a light pinkish hue, and the vessels were injected." Four others, that had been taken ill in the same way, recovered; but it was eight or nine days before any medicine operated, although great quantities were administered. In the third stomach of each there were a great number of small seeds from some unknown plant, said to have grown in this field at Bangor, and which had remained in the stomach from that night.

A more satisfactory proof of the serious nature of the maladies of this stomach is recorded†.

Towards the end of September, 1746, a great number of cows died at Osterwich, in the principality of Halberstadt. Lieberkuhn, a celebrated physician, (there were not any veterinary surgeons at that time,) was sent to examine into the nature of the disease, which was supposed to be one of the species of murrain that was then committing such ravages among the cattle in various parts of the continent. There were none of the tumours, or pestilential buboes, that in an earlier or later period of the malady usually accompanied and characterised murrain, but, on inspection of the dead bodies, considerable peritoneal inflammation was found; the first and second stomachs were filled with food, but the third stomach was the palpable seat of disease—its leaves were black and gangrened. The mass contained between the leaves was black, dry, and so hard that it could scarcely be cut with a scalpel. It intercepted the passage of the food from the two first stomachs to the fourth; and this latter stomach was empty and much inflamed. Neither the heart nor the lungs nor intestines exhibited

* *Moyens Curatifs*, par Vicq-d'Azir, p. 481.

† *Disputations de Haller*, Tom. v.—*Journal Pratique*, 1826, p. 38.

any trace of disease. Twelve cows were opened, and the appearances were nearly the same in all of them.*

M. Lieberkuhn thus accounted for the disease: the pasture had been overflowed in the preceding month, and when the water subsided, vegetation was much quickened by the united influence of moisture and heat, and the numerous poisonous plants with which that locality abounded (different species of dropwort, clematis, and ranunculus growing rapidly, and succulent with the rest) not possessing the natural odour or taste of the mature plant, the beasts, like those in the island of Tornea, fed on them unconsciously, and the poisonous principle which they contained was evidenced in the paralysis, or over-excitation of the muscles of the manyplus.

This state of the manyplus is one of the most serious species of indigestion to which these animals are subject, and deserves the attentive consideration of the practitioner. There are, nevertheless, many difficulties accompanying the study of this important subject, and which chiefly arise from the present wretched state of the knowledge of cattle-medicine. The symptoms by which primary or dangerous disease of the manyplus may be distinguished from that of the other stomachs, and the manner in which it can be successfully treated,—these are points on which no author has written, nor has any veterinary teacher on the south side of the Tweed instructed his pupils with regard to them. There is no clue, no light, to guide the bewildered practitioner on his way. Is it not disgraceful, that when the veterinary art has professedly been studied in England more than forty years, no effective school of cattle-medicine has yet been established; but oxen and sheep, the most valuable of the live stock of the agriculturist, continue to be abandoned to the ravages of the various diseases to which they are exposed? It is high time for the different farming societies and for government to interfere, and to protect the most important interests of the agriculturist, and the most effectual source of national prosperity and wealth.

The *clue*, or *fardel-bound*, names by which the retention of the food in the manifolds is distinguished, may be occasionally produced by the animal feeding on too stimulating plants, or on those which are of a narcotic nature. A sudden change from green and succulent food to that which is hard and fibrous may also readily be supposed to be a very likely cause of it. The strange fancy that induces many cows, and especially those in calf, to refuse the soft and nutritious food of the pasture and browse on the coarse grass and weeds which the hedges produce, will necessarily overload the manyplus with hard and fibrous substances; and many a beast has suffered in this way from being too rapidly and exclusively put on chaff of various kinds.

The symptoms vary in different animals, but the following is an outline of them: the animal is evidently oppressed; the pulse is somewhat accelerated and hard; the respiration not so much quickened; the muzzle is dry; the mouth hot; the tongue protruded, and seemingly enlarged; the membrane both of the eyes and nose is injected; the eye is protruded or weeping; the head is extended; the animal is unwilling to move; and the gait is uncertain and staggering, the urine is generally voided with difficulty, and is sometimes red and even black. There is apparent and obstinate costiveness, yet small quantities of liquid fæces are discharged. As the disease proceeds, and often at an early period, there is evident deter-

* The reporter adds, (exhibiting the wretched state of veterinary science, and how far the most scientific men were deluded by the absurd notions of the cow-keeper of that period), "we examined and divided the tail in various parts, and found it in its natural state."

mination of blood to the head, evinced not only by this staggering gait, but by a degree of unconsciousness ; the eyes weep more ; the lids are swollen ; the costiveness continues or some hardened excrement is voided, but foetid and mixed with blood ; rumination ceases ; the secretion of milk is usually suspended, or the milk becomes offensive both in taste and smell ; the urine flows more abundantly, but that too continues of a dark colour.

Many of these symptoms distinguish this complaint from distension of the rumen ; there is not the hardness at the flanks, and the general swelling of the belly, which is observed in distension by food ; nor the greater distension and threatened suffocation which accompany hoove. In bad cases, and when the symptoms take on much of the character of that undescribed and unintelligible disease, wood-evil, tremblings of the frame generally, a degree of palsy, coldness of the extremities, actual swelling of the tongue, the eyes glaring, and the ears and the tail being in frequent and convulsive motion,—these are the precursors of death.

The period of the termination of the disease is uncertain ; it extends from three or four days to more than as many weeks. Many of these symptoms so often accompany other diseases that they are utterly insufficient always, or generally, to lead to a right conclusion as to the nature of the complaint ; and careful enquiry must be made into the history of the case.

The treatment is as unsatisfactory as the history of the symptoms. It will always be proper to bleed in order to diminish any existing fever, or to prevent the occurrence of that which continued disease of this important stomach would be likely to produce. To this should follow a dose of physic, in order to evacuate the intestines beyond the place of obstruction, and, by its action on them, possibly recall this viscus also to the discharge of its healthy function. The Epsom salts, with half the usual quantity of ginger, will form the best purgative ; and it should be administered either by means of a small horn, or the pipe of the stomach-pump introduced half way down the gullet, and the liquid very slowly pumped in. By this cautious method of proceeding the pillars of the œsophagean canal will probably not be forced open, and the liquid will flow on through the passage still partially open at the bottom of the manyplus, and thence into the abomasum. Of the sympathetic influence which the establishment of increased action of the intestines has on the stomachs above, in rousing them to their wonted function, mention has already been made : it is a fact of much importance, and should never be forgotten by the practitioner.

A consideration of the nature of the disease will necessarily lead to the next step. Either a great quantity of food is retained between the leaves of the manyplus in a natural and softened state, or it is powerfully compressed there, and has become dry and hard. Now the longer leaves of this stomach reach from the roof almost or quite to the base of it, and some of them float in the continuation of the œsophagean canal through which all fluids pass in their way to the fourth stomach. Then plenty of fluid should be made to flow through this canal ; and this may readily be effected by the small horn, or much better by the stomach-pump. An almost constant current of warm water may thus be kept up through the canal, by means of which the food retained towards the lower edge of the leaves, and most obstinately retained there on account of the hook-like form of the papillæ, will be gradually softened and washed out. This will leave room for the descent of more ; and the natural action of this portion of the leaves being possibly re-established, when freed from the weight and oppression of that by which they had been filled, the mass that remains above will begin to be loosened ; it will gradually descend and be softened by the stream, and it too will be carried off ; and so, in process of time, a great part of

the stomach will be emptied, and the manifolds will be so far relieved as to be able to renew its natural function.

The use of oil has been recommended for this purpose, but the hardened food will be more readily softened by warm water, than by any oleaginous fluid that can be administered. Some portion of aperient salt should be dissolved in the water, in order that purgation may be established as soon as possible, or kept moderately up when it is established; but no heating, stimulating, tonic medicine, beyond the prescribed proportion of aromatic to the purgative, should on any account be given, for it is impossible to tell what inflammatory action may be going forward in the manyplus, or to what degree the spasmodic contraction on its contents may be increased. No food should be allowed except soft or almost fluid mashes, but the animal may be indulged in water or thin gruel without limit. Clysters can have little effect, and will only uselessly tease the animal already sufficiently annoyed by frequent drenching.

After all, it may be doubtful whether the injury and danger produced by the distension of the manifolds with food is not sometimes brought about in a different way from that which has been hitherto imagined. This stomach has already been described (p. 425), as situated obliquely between the liver and the right sac of the rumen, and, therefore, when distended by food it will press upon the liver, and impede the circulation through the main vessel that returns the blood from the intestines to the heart, and thus cause the retention of an undue quantity of blood in the veins of the abdomen. From this will naturally or almost necessarily arise a determination of blood to the brain, and the winding up of the disease by a species of apoplexy. This, however, will not alter the opinion that has been given of the proper treatment of the disease; but will throw considerable light on the nature and causes of some of these determinations to the head, which have not hitherto been perfectly understood.

MALFORMATION OF THE MANYPLUS.

A singular construction of the manifolds is related by Mr. Harrison, and from which some useful hints may be derived*. He says that "two cows were observed, during the whole of their lives, to eat a more than ordinary quantity of food; so much so, as at some times to double, and even treble, that which was consumed by ordinary cattle. They did not, however, repay this great consumption by a better appearance or more plentiful supply of milk; on the contrary, their milk was rather smaller in quantity, and of an inferior quality compared with ordinary cows; and the fattening of them was attended with great cost and trouble, and took much longer than the usual time.

I for a long time narrowly watched them, unable to give any satisfactory reason for their great voracity, and frequently thinking that if bulimia (unnatural appetite) was ever known to exist in the brute creation, it was here presented to my view, for food of every description, except animal, was devoured by them with wonderful rapidity. The cause of this remained unknown and unsuspected until they were slaughtered, when, to me, a most important point in the physiology of digestion in ruminants stood clearly developed; for, upon examining into the structure of their manifolds, the internal surface of one of them merely displayed rugæ not quite so long as my finger, and in the other the corrugations were even less strongly marked.

The fact, then, was plainly demonstrated, that the food in these two cases, owing to the mal-formation of the manifolds, was not retained that

* Veterinarian, 1833, p. 584.

length of time which was necessary for the breaking or macerating of it into a pulp, for the complete action of the abomasum and intestines; and that in its passage through the latter, as much chyle could not be separated from an equal quantity of food, as would have been had not nature played this freak; and that from this cause they were obliged to take in a larger quantity, or in other words, to eat more frequently than ordinary cattle, in order to produce the required quantity of nutriment for their due support, and the healthy performance of the various secretions."

THE DISEASES OF THE ABOMASUM OF FOURTH STOMACH

Our knowledge of the nature and symptoms and treatment of these diseases is as imperfect as of those of the manyplus. Concretions, and most of hair, are occasionally found in this stomach, which, by their pressure, must produce disease to a certain extent. Poisonous substances, received into this stomach after rumination, as is sometimes the case, when the plants are fully grown, from the deficiency of acute taste in the ox, and which oftener happens when, in spring, neither their taste nor their smell is developed, produce inflammation and ulceration of the coats of the abomasum. Inflammation may and does exist from other causes, as exposure to too great heat, and the continuance of unseasonable cold and wet weather, too sudden change of food, the administration of acrid and stimulating medicines; but the practitioner can rarely distinguish them from inflammatory disease of the other stomachs, or of the intestinal canal.

So far as the catalogue of symptoms can be arranged, they are nearly the following: there is fever; a full and hard pulse at the commencement, but rapidly changing its character and becoming small, very irregular, intermittent, and, at last, scarcely to be felt except at the heart. The beast is much depressed and almost always lying down, with its head turned towards its side, and its muzzle, as nearly as possible, resting on the place beneath which the fourth stomach would be found; or when standing, it is curiously stretching out its fore limbs, with its brisket almost to the ground. The inspirations are deep, interrupted by sighing, moaning, grinding of the teeth, and occasionally by hiccup; the tongue is dry and furred, and red around its edges and at the tip; the belly generally is swelled, more so than in distension of the rumen by food, but less so than in hoove, and, as further distinguishing the case from both, it is exceedingly tender; there is frequently distressing tenesmus, and the urine is voided with difficulty and drop by drop. After death, the stomach exhibits much inflammation of the lining membrane, but very seldom any ulceration.

The remedies would be bleeding, purgatives, mash, and gruel*.

It is almost useless to dwell longer on this unsatisfactory portion of the subject, except to warn the practitioner against being misled by the peculiar softness of the inner lining membrane of the fourth stomach of the ox. That which would be said to be diseased condition, or softening, or even decomposition of the inner coat of the stomach in other animals, is the natural state of the abomasum in cattle.

VOMITING.

A case was related, in page 436, of the treatment of a cow that had gorged herself by eating wheat chaff. Water was injected into the rumen,

* Some of the foreign remedies for this malady are stranger and more absurd than those which disgrace the practice of the most ignorant empirics in the British islands. A pound of shot is first administered, and this succeeded, or perhaps superseded by a drug of a very different kind; a black pullet is roasted with all its feathers upon it: it is then pulled to pieces, boned, and crammed down the throat of the animal. Toggia, *Malattie de' Bovei*, tom. i. p. 63.

until that stomach began to react upon its contents, and a considerable proportion of them was discharged by vomit. M. Girard mentions a case in which the contents of the rumen were thrown off without this injection of water. He was sent for to some cows that had been feeding on young lucern, and that were beginning to swell. He found one in the act of dying; two others were prodigiously swelled—they breathed with difficulty, and seemed to be in danger of immediate suffocation; others were much inconvenienced by the distension of the paunch. He hastened to puncture the flank of one of those that appeared to be in extreme danger; and, while he was thus employed, the other, after some convulsive efforts, vomited two pailsful of unmasticated food. Her flanks immediately subsided, and in the course of a very little while she seemed to have perfectly recovered*.

The knowledge of these facts, of the occasional occurrence of which few practitioners can be ignorant, will point out a mode of proceeding that promises the happiest result when the stomach is distended by food. This is not, however, strictly speaking, the act of vomiting; it is only an extension of the process of returning the food to the mouth for the purpose of rumination, or it is the whole returned suddenly and in a mass, instead of pellet after pellet. True, vomiting is the return of food from the fourth or digesting stomach, that which alone may be considered as a veritable stomach, in distinction from the mere preparatory functions discharged by the others. Respecting this, it has been stated in page 428, that it is comparatively a rare process, and attended with extreme danger. The slightest reconsideration of the structure and connexion of that portion of the digestive apparatus which has been described, will render it evident that every thing is disposed to facilitate the return of the food from the rumen to the mouth, but to render that return difficult from the fourth stomach. First, there is the fold of that stomach placed at the entrance into it from the manyplus. It is delineated at *g* and *h*, page 424. It evidently leaves a free and open way to the substances that pass from the third stomach into the fourth, but presents an almost perfect valvular obstruction to their return. Supposing that could be surmounted, it is evident that when the fourth stomach, pressed upon by the abdominal muscles and the diaphragm, contracted, the other stomachs would contract too, and especially the manyplus; and, in that contraction, the aperture between it and the œsophagean canal would be firmly closed: or even, if that were not the case, there is only a small circular aperture between the œsophagean canal and the fourth stomach, through which the returned semifluid mass would pass very slowly, and not in the quantity in which it would be ejected from the abomasum in the effort to vomit.

M. Fleurens put this to the test. He injected a solution of emetic tartar into the veins. This was followed by the greatest distress, and violent efforts to vomit, but not a particle of the remasticated food was returned. He injected more into the manyplus, whence it passed into the abomasum. The efforts to vomit were here also violent, but fruitless†.

There is, however, a case of true vomiting, so singular, as to deserve to be put upon record. An ox presented the following appearances: the hair rough; the skin dry and adherent; the muzzle dry; the appetite diminished; rumination slow and seldom; and slight tension of the left flank. Having heard that the animal occasionally vomited, the practitioner determined to remain awhile in the stable in order to satisfy himself of the accuracy of the account. In about an hour rumination commenced, preceded by deep and sonorous eructations having a penetrating odour. This

* *Memoire sur le Vomissement*, par J. Girard, p. 24.

† *Recueil Méd. Vét.*, Aout 1833.

lasted about ten minutes ; after which the animal got up, backed himself in his stall ; hung on the chain ; his fore limbs trembled ; he brought his hind extremities as much as possible under him, and bent his neck, and depressed his head, and, after a deep and powerful inspiration, he vomited 15 pounds of semifluid matter, perfectly triturated. The vomiting ceased, the ox remained for a moment motionless, and then lay down again, and ruminated afresh. He continued this about thirty-five minutes, when he had a renewed fit of vomiting perfectly similar to the preceding.

This was the only one of the herd that vomited, but the others were constipated, and hide-bound, and in every way out of condition. The cause of this was supposed to be that the animals were driven nearly a league twice every day in order to be watered, at a time when the heat was excessive. They were ordered to be oftener watered, and that at home ; and the one that vomited was bled, physic was administered, and the sickness almost immediately ceased*.

It is impossible to doubt the accuracy of this account, or that it was a case of true vomiting. The matter discharged was semifluid, and well triturated, and, consequently, could neither come from the rumen nor the manyplus. The same author, M. Creuzel, relates other instances of what he terms vomiting, but evidently ejection of the contents of the rumen : all of them were connected with hoove, and in every case the animal experienced immediate and perfect relief.

CHAPTER XII.

THE ANATOMY AND DISEASES OF THE SPLEEN, LIVER, AND PANCREAS.

THE SPLEEN.

THE *Spleen*, or *Melt*, is a long, thin, dark-coloured substance, situated on the left side, attached to the rumen, and between that stomach and the diaphragm. It is longer, and yet narrower and smaller in cattle than in the horse, and is more closely tied to the stomach by blood-vessels, and cellular texture. In the horse, it is thick at one end, and tapers towards the other ; in cattle, it is of a uniform size through its whole extent, except that it is rounded at both ends. Of its use we are, in a manner, ignorant ; and it has been removed without any apparent injury to digestion. Its artery is large and tortuous, and its vein is of great size, and forms a considerable portion of that which conveys the blood from the other contents of the abdomen to the liver. It is probably connected either with the functions of the liver, or with the supply of some principle essential to the blood.

It is subject to various diseases, inflammation, ulceration, increased size, tubercles, hydatids, ossification ; but in the present state of cattle medicine it is impossible to state the symptoms by which the greater part of these are characterised.

In sheep, inflammation of the spleen, and hæmorrhage from it, or exudation of blood through its coats, is not an uncommon disease. In those that die of inflammatory fever, with which a high degree of intestinal inflammation is connected, or that perish in consequence of inflammation of the peritoneum or investing membrane of the bowels, it is not unusual to find an effusion of a deep blood-coloured fluid in the abdomen. This has been almost uniformly attributed to one or the other of these diseases, in propor-

*Journal Pratique, 1830, p. 322

tion as they have been observed to prevail; but the occasional seat of disease, the spleen, and which is found most especially to have suffered, is too frequently overlooked. So it is in cattle. A beast in high condition, over-driven, or placed in too luxuriant pasture, is suddenly taken ill: he staggers; his respiration becomes laborious; his mouth is covered with foam; he stands with his head stretched out, labouring for breath; he moans; blood escapes from the nostrils or the anus; the disease runs its course in the space of a few hours, and the animal staggers and dies. On opening him, the vessels beneath the skin are all gorged with blood; the skin itself is injected and red; the lungs and abdominal viscera are congested with blood; the liver is gorged with it. It is inflammatory fever that has destroyed the animal; but the spleen is most of all affected and disorganised—it is augmented in size, softened, its peritoneal covering torn, and blood has rushed from it and filled the belly; or the blood has oozed through the investment without any visible rupture.

In such a malady, the skill of the practitioner can be of little avail. Had the peculiar determination of disease to the spleen been discovered, it could not have been arrested; and all that can be obtained is a lesson of wisdom, a caution to adopt a more equable and less forcing system of feeding, and the avoidance of all those causes of general inflammation in which the weakest organ suffers most, and by its disorganization, causes, or, at all events, hastens death. M. Dupuy, professor of the veterinary school at Toulouse, records a case of hæmorrhage from the spleen, but not attended by so much general inflammation as is usually found. He says, that on the 21st of March, 1831, a beast, eighteen or twenty hours after it died, was brought to the school to be examined as to the cause of death. It had a cough for several months; but the disease that had probably destroyed it, had come on all at once, and had run its course in a few hours. The belly contained $2\frac{1}{2}$ gallons of blood, but the intestinal canal was perfectly sound. All the vessels of the abdomen were carefully examined, in order to discover the source of hæmorrhage, but no rupture was found. The liver was double its natural size, soft, friable and of a grey colour. The spleen three times as large as it is found to be in a state of health. The peritoneal covering was detached from the substance of the spleen, and the cavity thus made was filled by a clot of blood three or four lines in thickness; and towards the middle of the inferior border was a laceration four or five inches in length, whence the blood had flowed. The substance of the spleen was reduced to a semifluid form, and was of a livid red-colour. The pericardium contained half a pound of bloody serosity.*

THE LIVER.

This organ is situated on the right side of the abdomen, between the manyplus and the diaphragm. It is principally supported by a duplicature of the peritoneum extending from the spine; and is confined in its situation by other ligaments, or similar peritoneal duplicatures connecting its separate lobes or divisions with the diaphragm. It is divided into two lobes of unequal size. The right lobe is larger than that in the liver of the horse; the smaller one is comparatively diminutive; and, altogether, the liver of the ox is less than that of the horse.

It has just been stated that the blood from the other contents of the abdomen, instead of flowing directly to the heart, passes through the liver. It enters by two large vessels, and is spread through every part of the liver by means of the almost innumerable branches into which these vessels divide. As it passes through the liver, a fluid is secreted from it, called the

* Journ. Prat. de Méd. Vét., Mai 1831, p. 161.

bile, probably a kind of excrement, the continuance of which in the blood would be injurious, but which, at the same time, answers a peculiar purpose in the process of digestion, that will be presently described.

The bile thus secreted flows into the intestines, and enters the duodenum through an orifice, the situation of which is marked out by *h*, p. 426. In the horse, it flows into the intestines as fast as it is secreted or separated from the blood; but in cattle, a portion of it, probably a comparatively small portion, is received into a reservoir, the *gall-bladder*, where it is retained until needed for the purpose of digestion. While the ox is grazing or asleep, there is no necessity for the whole of the bile to run on into the intestines, but a part of it accumulates in the gall-bladder. While it is retained there, it undergoes some change; part of the water which it contains is absorbed, and the residue becomes thickened, and more effective in its operation; and when the animal begins to ruminate, and portions of food pass through the fourth and true stomach into the duodenum, not only is the flow of bile into the gall-bladder stopped, but, either by some mechanical pressure on that vessel which no one has yet explained, or, more probably, by the sympathy which exists among all the organs of digestion, and the influence of the great organic nerve causing the (probably) muscular coat of the vessel to contract, the bile flows out of its reservoir, and proceeds to its ultimate destination, along with the portion which continues to run directly from the liver into the intestine, through the medium of the hepatic duct. This pear-shaped reservoir, the gall-bladder, is placed in a depression in the posterior face of the liver, and adheres to it by means of a delicate cellular texture. The construction of this vessel deserves attention. It has the same external peritoneal coat with the viscera generally; beneath is a thicker coat, evidently composed of cellular substance, in which no muscular fibres have yet been demonstratively traced, but in which they may be well conceived to exist, and in which, doubtless, they do exist, in order to enable the gall-bladder to contract and expel its contents. The inner coat is a very singular one. It has not precisely the honeycomb cells of the reticulum in miniature, but it is divided into numerous cells of very irregular and different shapes, in the base of which, as in the cells of the reticulum, are minute follicular glands that secrete a mucous fluid to defend the internal surface of the gall-bladder from the acrimony of the bile which it contains.

INFLAMMATION OF THE LIVER.

Cattle, and especially those that are stall-fed, are far more subject than the horse to inflammation of the liver. This appears evidently enough on examination after death, but the symptoms during life are exceedingly obscure, and not to be depended upon. An almost invariable one, however, is yellowness of the eyes and skin; but this accompanies, or is the chief characteristic of obstruction of the biliary duct, and possibly exists without the slightest inflammation of the substance of the liver. It should also be remembered that there is scarcely any acute disease to which cattle are subject in which the liver does not sympathise.

We shall have reason to suppose, by-and-by, that the bile performs an important part in the process of digestion. It is secreted in great abundance in a healthy state of the animal, and that secretion is very much increased under almost every intestinal disease, on account of the sympathy which exists between the liver and the other organs of digestion. The feeding too much on oil-cake will produce in most cattle a yellowness of the skin during life, and a yellow tinge of the fat and the envelopes of the muscles after death.

In addition to the common symptoms of fever, (quickness of the pulse, heaving, dryness of the muzzle, heat of the mouth and root of the horn, listless or suspended rumination,) those that would lead to the suspicion of inflammation of the liver would be, lying continually on the right side, slight spasms on that side, or wavy motions of the skin over the region of the liver,—a general fulness of the belly, but most referrible to the right side, and the expression of considerable pain when pressure is made on that side. Occasionally, the animal looks round on this part, and endeavours to rest his muzzle upon it. There is usually some degree of constipation; the beast does not urinate so often or so abundantly as in health, and the urine is yellow or brown, or, in a few cases, bloody.

The proper remedies are bleeding, physic, blisters on the right side, and restricted diet, from which everything of a stimulating kind is carefully withdrawn. The most frequent causes of this complaint are blows, over-driving, the use of too stimulating food, and the sudden repulsion of some cutaneous disease.

Inflammation of the liver sometimes takes on a *chronic* form. Perhaps it never assumed any great degree of intensity, or the intense inflammation was palliated, but not removed; and this state may exist for some months, or years, not characterised by any decided symptom, and but little interfering with health. Then commences induration, or hardening of a portion of the liver, or of the greater part of it, and accompanied by tubercles, vomicae, hydatids, and the existence of the fluke-worm in the ducts.

A cow came up from the west to Smithfield market, in the year 1832. She was in tolerable condition, yet not in such a state as to afford a chance of her being bought by any respectable butcher; she was, therefore, set apart for the sausage-makers, and to them she was sold. She walked pretty well with the other cattle, and had no indication of disease, except enlargement of the belly, yellowness of the skin, and her not carrying so much flesh as the rest. On examination after death, the liver weighed no less than 137lbs., and measured, from one lobe to another, more than a yard and a quarter. There was little of the common appearance of inflammation, but it was evident that there were numerous hydatids: in fact, they occupied the larger part of the organ, and had hollowed it into various cavities of greater or smaller size. One cavity, nearly thirty inches in circumference, presented when opened the appearance of a honeycomb, all the cells of which, and the whole of the excavation, were filled with hydatids, from the size of a sparrow's egg to that of a swan: there were nearly 300 of them. Some cysts were filled with blood, and others with matter of a fibrous character, and others had large fibrous cords extending from side to side. A few portions presented nearly the character of healthy liver, but, in general, where there were no hydatids, the substance resembled a deposit of matter that had gradually hardened into cartilaginous cells, and the centre of the liver was perfectly fibro-cartilaginous, without any trace of its original structure. This disease had probably existed during a long period, and had only interfered with health by preventing her attaining the usual condition of fatted cattle.

Mr. Goodworth, of Howden, relates another case of the existence of disease of the liver, apparently for a considerable period, and not interfering with health. He says, that "a cow, the property of a neighbour, had calved, and done well. She was milked twice a day, and appeared in good health for six weeks, when the maid going to milk her in the morning found her very uneasy, and evidently ill. The cow was bled, and a messenger was sent to a druggist for medicine; but although he was absent only a few minutes, the cow was dead on his return. On opening the

body, all the abdominal viscera were found in perfect health, except the liver, the right lobe of which was much enlarged; and on an incision being made into it, a quart of matter of the consistence and colour of cream escaped.*

The difficulty of detecting this chronic inflammation during the life of the animal throws much obscurity on the mode of treating it. Permanent yellowness of the skin—a constant, but not violent cough—and the want of, or the slowness in acquiring, condition beyond a certain degree, would be the symptoms of most frequent occurrence. The treatment should consist of the frequent exhibition of gentle purgatives, with a more than the usual quantity of the aromatic (six ounces of Epsom salts, and half an ounce of ginger), and the food should be green, succulent, and as little stimulating as possible. Mercury, to which recourse is usually had when a similar complaint is suspected to exist in the human subject, would be worse than thrown away upon cattle. In the majority of cases in which it is used for the diseases of cattle, it produces decided injurious effect.

HÆMORRHAGE FROM THE LIVER.

It has already been observed that when these animals are turned on the fresh grass in the spring or the fog in autumn they are subject to various plethoric or inflammatory complaints. The ravages of apoplexy and inflammatory fever at these times have been described. An undue quantity of blood rapidly formed oppresses the whole system, and, from some cause of determination to it, a particular organ or part becomes violently congested or inflamed, and the animal is destroyed. The liver occasionally suffers in this way.

A case will illustrate this. It occurred in the practice of Mr. Tait, of Portsoy. He was requested to see a heifer, two years old, that on the previous night had been observed to be unwell. The pulse was 80, nearly imperceptible at the jaw; the extremities were cold, and rumination was suspended. There was much trembling of the hind quarters. An attempt was made to bleed her, but ere the blood could flow, she fell and expired. On opening the belly, the cavity was found to contain nearly six gallons of blood, which had escaped from a rupture, two inches in length, in one of the lobes of the liver†.

It would have been more satisfactory if fuller particulars of the previous symptoms of the disease and of the appearance of the other viscera had been given, but the experience of almost every practitioner will supply the deficiency. Certain beasts have died of some obscure disease; it has been rapid in its progress, and not characterized by any symptoms of great inflammation, or the inflammatory symptoms, if such had appeared, have subsided, and those of evident and extreme exhaustion have succeeded. The pulse has been feeble, or almost indistinct—the mouth has been cold—the membranes of the mouth and nose pale. The breathing has been accelerated, and the weakness extreme. After death, the substance of the liver has been found softened; it has broken on the slightest handling; it may be washed away, and the various vessels which permeate it exposed: the peritoneal covering has been loosened—elevated from the liver,—and the interval has been occupied by a clot of blood; and from some rupture in this covering, which has partaken of the softening of the viscus itself, a quantity of blood has been poured out; or it has oozed through the covering, and partially or almost entirely filled the cavity of the abdomen.

* The "Veterinarian," June, 1831, p. 307.

† Ibid. March, 1834, p. 147.

In such a case, the resources of medical art would be powerless ; but every instance of hæmorrhage from the liver should be regarded as a warning against the adoption of too forcing a system of fattening, especially in young beasts, and in the spring or fall of the year.

JAUNDICE, OR THE YELLOWS.

There are few diseases to which cattle are so frequently subject, or which are so difficult to treat, as *jaundice*, commonly known by the appropriate name of *the yellows*. It is characterised by a yellow colour of the eyes, the skin generally, and the urine. Its appearance is sometimes sudden, at other times the yellow tint gradually appears and deepens. In some cases it seems to be attended, for a while, by little pain or inconvenience, or impairment of condition ; in others, its commencement is announced by an evident state of general irritation and fever, and particularly by quickness and hardness of pulse, heaving of the flanks, excessive thirst, and the suspension of rumination ; to these rapidly succeed depression of spirits, and loss of appetite, strength, and condition. The animals can scarcely be induced to move, or they separate themselves from the herd, and retiring to the hedge, either slowly pace along the side of it, or stand, hour after hour, listless and half unconscious. Not only the skin, but the very hair, gradually becomes yellow ; a scaly eruption appears, attended by extreme itching, and sometimes degenerating into the worst species of mange. It is seldom, indeed, that bad mange appears among cattle without being accompanied by a yellow skin ; and the cutaneous eruption was probably caused by the presence and constant excretion of bile irritating the exhalent vessels of the skin. A state of costiveness usually accompanies the yellow skin, at least in the early period of the disease, although diarrhœa, which no astringents will subdue, may afterwards appear, and, in fact, will generally wind up the affair, and carry the patient off. Jaundice cannot long exist without being accompanied by general impairment of health, and loss of condition. Cows are particularly subject to it in spring and autumn. The milk soon shares in the yellowness of the other secretions, and occasionally acquires an unpleasant and bitter taste.

The usual cause of jaundice is obstruction of the passage of the bile from the gall-bladder into the duodenum. This obstruction is effected in various ways ; but most frequently by biliary concretions or calculi. During the continuance of the bile in the gall-bladder, a certain portion of the water which it contains is removed by the process of absorption ; the residue becomes proportionably thickened, and the most solid parts are either precipitated, or form themselves into hard masses. Biliary calculi are not unfrequently found in the gall-bladder of cattle, of varying size, from that of a pin's head to a large walnut. Their form indicates that they were composed by some process of crystallization ; they are round, with concentric circles, or conical, or assuming in a rude way the form of a cube, or a pentagon, or hexagon. There is usually some central portion of harder bile round which the rest is collected. They are of less specific gravity than the bile, and even than water, and are found swimming in the gall-bladder. They are composed of the yellow matter of the bile, with a portion of mucus holding it together ; and this colouring matter is valued by the painter on account of its peculiar and almost unrivalled permanence. It is insoluble in water and alcohol, but it readily diffuses itself in a solution of potash.

So far as can be observed, the presence of these calculi in the gall-bladder does not inconvenience the animal, or interfere with health, for they are

found in the greater number of oxen that are brought to the metropolitan slaughter-houses. At all events, there are no recognised symptoms by which their presence can be detected, or even suspected. In some cases the writer of this work has detected more than a hundred small calculi in the bladder of one ox*.

Sometimes, however, they enter the duct (the cystic) which conveys the bile to the intestines. They are likely to do this on account of their swimming on the surface of the fluid which the bladder contains. The cystic duct is large at its union with the bladder; it is a continuation of the neck of the bladder; and the gall-stone may be easily pressed into the commencement of the tube: but it has scarcely entered it before its passage is obstructed by the folds of the inner coat of the duct. These assume a semilunar form, with the edges projecting towards the bladder, and they act as partial valves, retarding the progress of the bile, so that it may not be all pressed out at once, but gradually escape as the process of digestion may require.

The gall-stone being thus impacted, violent spasmodic action takes place in the muscles of the duct, occasioned by the irritation of its continued pressure. It is fortunate, however, that although the muscles of these ducts act with some power, the obstruction is usually, with no great difficulty, overcome. The duct distends; as it distends, these valvular folds lie closer to the sides, and no longer oppose the passage of the calculus, which is pressed on until it reaches the common duct. The calibre of this tube is larger, and, unless the calculus is of considerable bulk, no farther difficulty occurs until it reaches the opening into the duodenum, which being situated in the centre of a muscular prominence, acting as a valve, and preventing the passage of all matters whether fluid or solid from the intestine into the ducts, a new difficulty is opposed to the progress of the gall-stones, and there is some return of pain, and in a few cases the pain is evidently more intense than in the early stage. At length this sphincter muscle of the duodenum dilates; the calculus enters the intestinal canal; the pain ceases, and the natural colour of the skin returns. In this species of jaundice, we have, in addition to the yellow skin, the heaving of the flanks, the hard concentrated pulse, the diminished appetite, the insatiable thirst and the other symptoms of fever. Then, too, we have the alternate coldness and heat of the ears, the roughness of the coat, the urine becoming first of a transparent yellow, and then opaque red, saffron-coloured, or brown, and the sediment brown. The bowels are constipated, the fæces seldom evacuated, and, when appearing, are hard and black.

Bleeding is now clearly indicated, and that until the animal becomes faint. During this partial sympathy, the muscles of the duct may cease their spasmodic constriction, and the calculus may pass on. To this should be added powerful purgation, consisting of doses of a pound and a half each of Epsom salts, or of a pound of the salts, with 10 grains of the Croton Tiglii; the medicine being repeated once in six hours, until purging is produced. Mashies should be given to hasten and increase the action of the physic, and the beast should, if possible, be turned out to grass during the day, and taken up at night. Opium or digitalis, and particularly the latter, may be given, in dozes of half a drachm of either, with a view to allay the violent constriction of the duct. From the knowledge that biliary con-

* "The number of calculi sometimes contained in the gall-bladder is almost incredible. Morgagni took 3646 out of this reservoir belonging to a human being; and in the Hunterian Museum, at Glasgow, 1000 are preserved, which are stated to have been extracted from one gall-bladder."—*Cyclopædia of Practical Medicine*, article Jaundice.

cretions dissolve in a solution of potash, considerable quantities of nitrate and acetate of potash have been given, but with doubtful success. Ether, hydrochlorate of ammonia, potash, and soda, have also been fruitlessly administered for the same purpose.

Another mechanical cause of jaundice may be the obstruction formed by the *fasciola* or *fluke-worm*. This singular parasite, resembling in form a little sole, and of the natural history of which, or of the changes that it has undergone, or may undergo, nothing is known, is found in great quantities in the livers of rotted sheep and deer, and, next to them, in the livers of cattle, and especially of those that are bred in low and marshy situations. They accompany almost every chronic disease of the liver, and often exist in the healthy animal. They inhabit the ducts into which the bile is poured from the smaller vessels of the liver—they are swimming in the bile, and said to be generally found working their way against the course of that fluid.

There is no case on record in which it has been proved by examination after death that the fluke-worm has mechanically obstructed the passage of the bile, and thus caused both the yellowness and the spasm, yet it can easily be imagined that this will sometimes occur. There are no peculiar symptoms to indicate the existence of these worms, for they have never been voided from the mouth or the anus:—to the first, there would be a mechanical impediment from the construction of both the lower and upper orifices of the stomach; and the digestive process going on through the whole of the intestinal canal would render the latter improbable, if not impossible. Their presence could only be guessed at from the nature of the pasture, or from their having been found in other beasts of the same herd.

The same means would be adopted as in supposed obstruction by a calculus, but with this probable difference, that the obstruction would be more easily and quickly removed.

Of the other species of jaundice in which the attack is more gradual, and apparently unconnected with pain, and in which the symptoms are weakness, listlessness, œdematous swellings, high-coloured urine, hardened excrement, declining condition, and occasional death, anatomical observation has discovered various causes. The state of the liver itself will sometimes account for every symptom. It may labour under chronic inflammation, without disorganization, and the secretion of bile will be considerably increased, and produced more rapidly than the ducts can carry it off, or than it can be disposed of in the process of digestion, and it will lurk in the intestines, and be taken up by the absorbents and carried into the circulation. At other times the diseased state of the liver prevents the escape of the bile, whether in its natural or even diminished quantity; thus, general enlargement of the substance of the liver will press upon and partially close the biliary ducts—tubercles, or other tumours in the liver, will effect the same thing. Inflammation may exist in the ducts themselves. They may become thickened or ulcerated, and thus cease to give passage to the bile, which will then be taken up by the absorbents of the liver, or mechanically forced back upon the vessels whence it was secreted. These are occasional causes of jaundice; and when they exist, it will not be wondered at that the complaint is obstinate, and too often fatal.

Sometimes the source of the evil may exist in the duodenum. It may be inflamed or ulcerated, or thickened, and so the opening from the biliary duct into the intestine may be closed: or the mucus which may be secreted in the duodenum may be too abundant, or of too viscid a character, and thus also the orifice may be mechanically obstructed.

What symptom will indicate to the practitioner which of these morbid

states of the liver, or its ducts, or if the first intestine, is the cause of the disease? or if it did, what means could he adopt in such a case with the hope of ultimate success? The treatment of confirmed jaundice is a thankless and disheartening business. The practitioner, however, must look carefully and anxiously to the symptoms, and be guided by them. There is no general rule to direct him here. If there is evident fever, he must bleed, and regulate his abstraction of blood by the apparent degree of fever. In every case but that of diarrhoea, and at the commencement of that, he must administer purgatives,—in large doses when fever is present, or in somewhat smaller quantities, but more frequently repeated, when constipation is observed; and in doses still smaller, but yet sufficient to excite a moderate and yet continued purgative action, when neither fever nor constipation exists. Considering, however, the natural temperament of cattle, the purgative should be accompanied by a more than usual quantity of the aromatic, unless the degree of fever should plainly forbid it. There are few things respecting which veterinary practitioners differ more than the kind of purgative that should be administered in this case. Some, who are usually partial to the Epsom or Glauber's salts, here prefer the aloes. Mr. Leigh, of Bristol, in a letter with which he favoured the writer of this treatise, says, that "jaundice is soon checked at the beginning, by administering Barbadoes aloes, Castile soap, and Venice turpentine;" Mr. Baker, of Reigate, as easily effects a cure by the administration of Epsom or Glauber's salts in doses according to the size of the beast; while the author of "the Survey of Somersetshire" gives us a remedy for yellows, which seldom or never fails; "flower of mustard, mixed with any liquid, and in doses of two ounces, repeated two or three times in the course of twenty-four hours.*"

It may not, perhaps, be quite a matter of indifference what purgative is administered. The Epsom salts here, as in other cases, is the safest, the most to be depended upon, and the most effective: but the secret of treating jaundice, not with the almost invariable success of which some speak, but with the best prospect of doing good, is by the repetition of mild purgatives, accompanied, and their power increased, and the digestive powers of the animal roused, and his strength supported, by the addition of aromatics and stomachics in such doses as the slight degree, or the absence, of fever may indicate. The writer of this article certainly cannot confirm by his testimony the opinion of the comparative ease with which the complaint may be removed: he has not only found it to be one of the most common affections of the liver, but one of the most untractable and fatal; and this from the insidious manner in which it proceeds until it has fixed itself on the constitution beyond the power of medicine to remove it. The following

* Some boil 8oz. of saffron in a quart of milk, and esteem it to be a never-failing cure of jaundice. The drink will certainly be expensive, but what good effect can be produced by the employment of this inert yellow drug for the cure of the yellow disease yet remains to be proved. Every one who is in the slightest degree acquainted with cattle medicine would pronounce such a decoction to be altogether ineffective. It was this superstitious notion of getting rid of one yellow by the application of another, that gradually made the powerless and useless turmeric an indispensable ingredient in cattle medicine, since jaundice is more or less mixed up with the various diseases to which cattle are subject.

The use of saffron, however, is of no recent date in horse as well as cattle practice. The following recipe is extracted from the Harleian MSS. No. 5107, as arranged in the library of the British Museum.

"Take three pennyworth of English saffron, two pennyworth of treacle, one pennyworth of sallad oyle, three of sugar candy, two of turmericke, and a quarte of milke. Seethe all this together, and then let it stand until it is cool, and give it to the horse fasting, and ride him a little upon it, and set him up warm, but he must be blooded first; and three howers afterwards give him a mash."

short directions comprise all that can be done :—subdue the inflammation or fever by bleeding and physic ;—keep the bowels afterwards under the mild but evident influence of purgative medicine ;—add aromatics and stomachics to the medicine almost from the beginning ; to these, if the strength and condition of the animal should appear to be wasting, add tonics—the gentian root will stand at the head of them ;—and lastly, when the disease has been apparently subdued, a few tonic drinks will restore the appetite, prepare for the regaining of condition, and re-establish the secretion of milk.

THE PANCREAS.

This is a long, irregularly formed, flattened gland, considerably smaller in cattle than in the horse, and confined in them to the left side of the abdomen, in the neighbourhood of, but not adhering to, the fourth stomach, and mostly connected with the duodenum and colon, by mesenteric attachments. It is of a pale red colour, and evidently composed of an accumulation of small glands resembling salivary ones ; each of them is a secreting gland, and a duct proceeds from each ;—these unite and form one common canal, which takes its course towards the duodenum, unites itself with the biliary duct, already described, and enters with it into the duodenum, as represented at *h*, in the cut in p. 426. The nature of the fluid thus conveyed will be presently considered.

This gland appears to be subject to very few diseases, and the symptoms of these diseases are, in the present state of the knowledge of the pathology of cattle, very imperfectly known. In a few instances, enlargement of the pancreas has been found after death ; (in one case, this conglomerate gland was more than treble its natural size ;) at other times, there have been inflammation, tubercles, a schirrous induration, and considerable abscess ; but there were no previous symptoms to lead to the suspicion that this gland was the principal seat of disease, and there were other morbid appearances in the stomachs or intestines, to indicate sufficient cause of death without reference to the state of the pancreas. This is a subject which deserves the attention of the veterinary surgeon and on which no one has yet ventured to write*.

We are now prepared to follow the passage of the food from the fourth stomach into the intestinal canal.

CHAPTER XIII.

THE ANATOMY AND DISEASES OF THE INTESTINES.

If the reader will refer to the cut of the Intestines of the Horse, in page 202 of the Treatise on that animal in the Farmer's Series, he will perceive a considerable difference in their appearance and structure in the horse and in cattle. There is in cattle comparatively little of the irregularity of size which is seen in the intestines of the horse. The colon and the cæcum, although larger than the small intestines in cattle, are diminutive compared with those viscera in the horse. The reason of this is

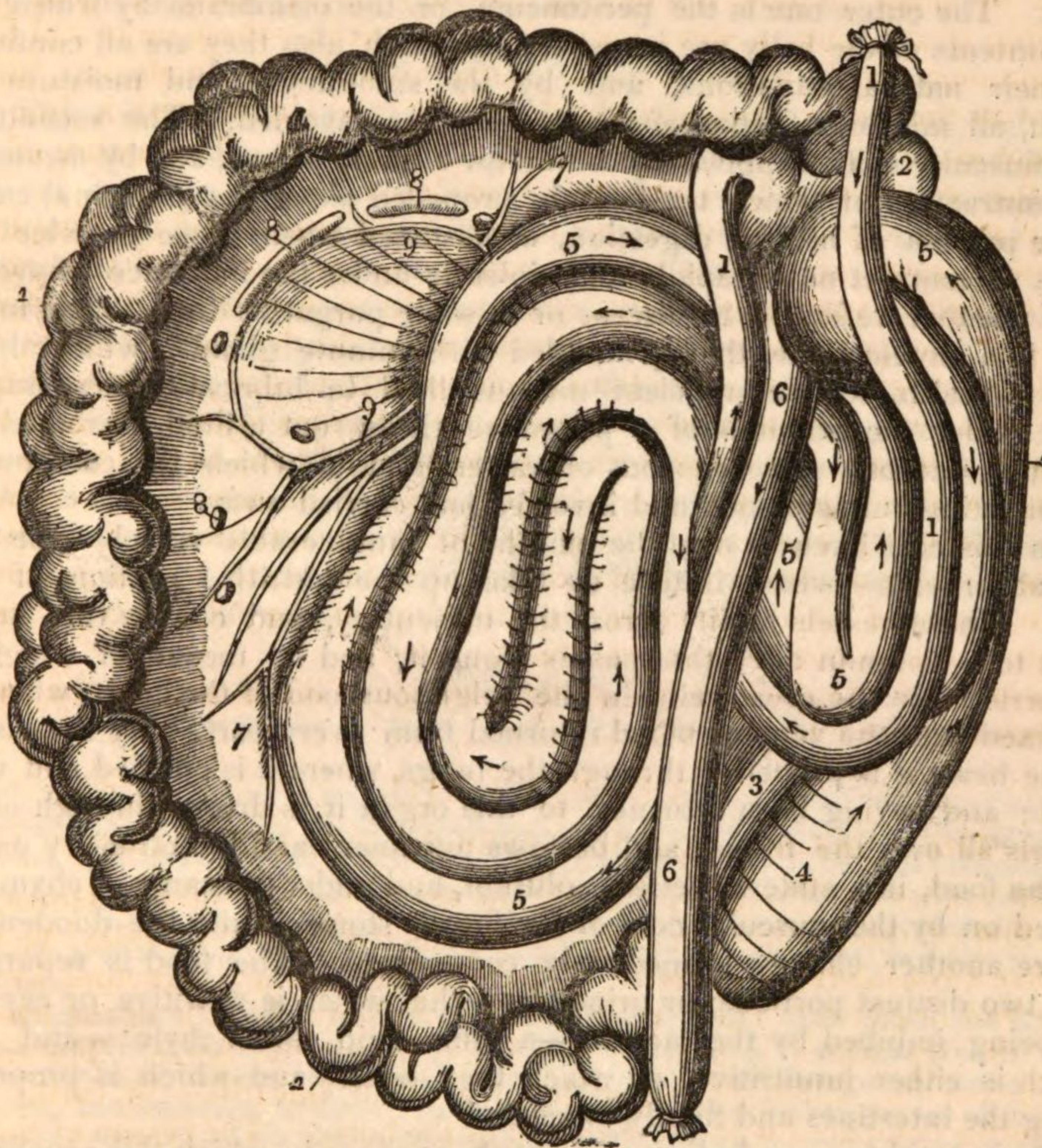
* As some guide to the researches of the veterinarian, the following extract from Dr. Abercrombie's valuable "Pathological and Practical Researches" is introduced.

"Many cases are on record of chronic disease of the pancreas, exhibiting much diversity of symptoms, and nearly in the following proportion :—Of twenty-seven cases which I find mentioned by various writers, six were fatal with gradual wasting and dyspeptic symptoms, and without any urgent symptoms. In eight, there were frequent vomitings, with more or less pain in the epigastric region ; and thirteen were fatal, with long-continued pain without vomiting : in some of these, the pain extended to the back, and in others it was much increased by taking food. In several there were dropsical symptoms, and in three or four there was jaundice from the tumour compressing the biliary ducts. In the morbid appearances also there was great variety."

sufficiently evident. The enormous development of the rumen, occupying nearly three-fourths of the abdominal cavity, leaves no room for an intestine so bulky as the cæcum of the horse: the bowels are therefore diminished in size, in order that they may be more readily packed wherever room can be found for them.

The larger intestines, particularly the colon and the cæcum, have not the cellated structure in cattle, which the slightest inspection of their external covering shews that they possess in the horse; and, consequently, the food will pass through them with considerably greater rapidity. Lest this, however, should prevent the abstraction of all the nutriment which it contains, and thus interfere with the destiny of cattle,—the furnishing of the human being with food while they are living and after they are dead,—the intestinal canal is greatly prolonged. The intestines of the horse are ten times as long as the body of that animal; the intestines of the ox are twenty-two times as long as his body.

Each intestine shall be briefly described.



1. The Duodenum.
2. The Jejunum.
3. The Ileum

4. The Cæcum.
5. The Colon.
6. The Rectum.

7. The Mesentery.
8. Mesenteric Glands.
9. Blood-vessels.

THE DUODENUM.

This, as will be observed at *a*, p. 203, in the *Treatise on the Horse*, is of considerable size in that animal compared with the small intestines; but it will be remarked (*g*, p. 426, and *fig. 1.* in this cut) that the duodenum is, at its commencement from the stomach, little larger than the jejunum and

ileum, which are prolongations from it. The stomach of the horse is an exceedingly small one; the food necessarily passes quickly out of it, and the work of digestion, so far as the stomach is concerned, namely, the dissolving of the food, and the conversion of it into one homogeneous mass, is imperfectly performed: therefore it is detained in the upper portion of the duodenum for this solution to be completed, or as much so as the nature of the food will admit, before the true function of this intestine commences. In consequence, however, of the maceration of the food in the rumen, the double mastication, and the mechanism of the manyplus, by means of which every fibrous particle is seized and ground down, the food is nearly dissolved before it enters the fourth stomach; it is easily completed there, and the duodenum has nothing to do of this nature. On this account, the duodenum of the horse is a capacious one; it is a kind of second stomach: while the duodenum of cattle is little larger than the small intestines which succeed to it.

The duodenum and all the intestines have, like the stomachs, three coats. The outer one is the peritoneum, or the membrane by which all the contents of the belly are invested; by which also they are all confined in their natural situations, and by the smoothness and moisture of which, all injurious friction and concussion are avoided. The second is the muscular coat, supplied by the motor organic nerves, and by means of the contraction of which the food is propelled along the intestinal canal in the process of healthy digestion, or hastened when those muscles are made to contract more rapidly and violently under the influence of irritation, whether referrible to disease or to some purgative drug. The inner coat is a mucous one, thickly studded with minute glands, which, in a state of health, secrete sufficient mucous fluid to lubricate the passage; and, under the stimulus of a purgative, throw out a fluid increased in quantity, and of a more aqueous character, and in which the contents of the intestines are softened and involved and carried away.

On this coat likewise open the mouths of innumerable vessels—the lacteal absorbents—which imbibe or take up the nutritive portion of the food. These vessels ramify across the mesentery, and convey this nutriment to a common duct that passes along it, and by means of which it is carried into the great veins in the neighbourhood of the heart, where it is mixed with the venous blood returned from every part. By the power of the heart it is propelled through the lungs, where it is purified and vitalized; and having been returned to this organ it is driven through other vessels all over the frame, and bestows nutriment and life on every part.

The food, in a state of perfect solution, and under the name of chyme, is forced on by the muscular coat of the fourth stomach into the duodenum, where another change immediately commences. The food is separated into two distinct portions or principles—that which is nutritive or capable of being imbibed by the lacteals—a white fluid called chyle;—and that which is either innutritive, or which they reject, and which is propelled along the intestines and finally evacuated.

There has been much dispute as to the manner in which this separation is effected. The chyme that has been formed by the agency of the gastric juice may contain in itself a tendency to this separation, or precipitation of the excrementitious part; or this may be effected by some fluid secreted from the mucous coat of the duodenum; or the bile and pancreatic juice may be the main agents in producing the change.

Ten or twelve inches down the duodenum, as may be seen at *h*, p. 426, two ducts penetrate the coats of that intestine, and pour into it the fluid secreted by the pancreas and liver. It would seem likely, from the dis-

tance from the stomach at which these fluids enter, that some change had already taken place in the contents of the duodenum, which was to be perfected by means of these auxiliaries. The separation or precipitation is more rapidly and effectually made; while the bile also has some stimulating effect on the coats of the stomach, urging the exhalents and the absorbents, and the muscles of the intestines, to stronger and more effectual action; and the pancreatic juice may dilute the biliary secretion, and shield the intestine from its occasional too great acrimony.

While, however, the bile is thus acting in promoting healthy digestion, (and no animals afford more frequent illustration of the connexion between the biliary secretion and the digestive process than cattle do,) the true notion of it is, perhaps, that it is an excrementitious substance, containing properties that would be noxious to the constitution, but, as in most of the contrivances of nature, the mode of its evacuation answers another and a salutary purpose*.

The length of the duodenum varies according to the fancy of different writers. It terminates in the jejunum, but there is no assignable point where the one can be said to terminate and the other begin.

THE JEJUNUM AND ILEUM.

These intestines, together with the duodenum, the cæcum, and a portion of the colon, will be seen (in the cut p. 467, at *figs. 2 and 3*) to be united together and enfolded in one common expansion of the mesentery. They lie on the right side of the belly occupying the flank, and resting upon the right portion of the rumen. The jejunum and the ileum constitute the border of this mesenteric expansion, and are disposed in the form of numerous spiral convolutions. If they were unfolded the length of these intestines would, in an ox of common size, amount to more than 100 feet. This length of small intestine is designed to compensate for the want of development and of cancelli in the larger ones. The food is detained by the length of the passage, and also by the construction of the convolutions. They may be considered as discharging the function of the cæcum and colon in the horse, and the principal absorption of chyle takes place in them.

THE CÆCUM

Is a very different viscus from that which bears the same name in the

* The gall of the ox is applied to various uses; it was formerly used medicinally, as readily combining with the hardened wax of the ear and contributing to its easier removal, and also as a mild and beneficial external stimulant in cases of inflammation of the ear, and particularly those of a chronic character and connected with partial deafness. It has also been adopted as a stimulant in some cases of ophthalmia, and old people used to think that it was beneficial in difficult menstruation, and also in difficult labour.

In commerce its value is of a more decided character. It is boiled and skimmed; one ounce of alum is then added to each pint of the gall; to another pint of the gall one ounce of common salt is added; the liquids are placed in separate bottles, corked down, and kept close for three months; the clear portion is then poured off from each, and the contents of the two bottles being mixed together, a precipitation or coagulum is rapidly formed, leaving a portion of the liquid above clear and colourless. This is called refined ox-gall. It is considered by some to possess a cosmetic quality; it certainly combines with the greasy matter with which old paintings may be stained, and also with that which may have been mixed with various colours; it gives a coating to ivory, and even to tracing paper and to satin, which enables the artist to paint with water colours upon them, and to lay successive coats of colours when drawing, and to fix chalk and pencil drawings so that they may be tinted. An extract of ox-gall has also been used instead of soap, more readily and effectually to clean greasy cloths.—*Gray and Rennie's Supplements to the Pharmacopæia.*

horse. It describes a considerable arch, (see Fig. 4. p. 467) the superior extremity of which is fixed to the portion of mesentery common to it and the small intestines, while the inferior portion floats loose in the abdomen, and is prolonged into the pelvic cavity, where it has a rounded termination. The portion of food that can enter into it is smaller than in the horse, and cannot be detained long there, because there are no longitudinal bands to pucker the intestine into numerous and deep cells; but the contents of the cæcum have the same character of being more fluid than in any other part of the intestinal canal. The length of the cæcum differs little from that of the horse, seldom exceeding a yard.

THE COLON.

This intestine is evidently divisible into two parts (see Fig. 5. p. 467); the one smaller than the cæcum is supported by the common mesentery, the other floats loose in the belly, and forms part of the second mass of intestines. It has somewhat the same convolutions as in the horse, but is destitute of its muscular bands. It is also less than the cæcum, but, combined with the next and the last intestine, the rectum, it measures more than thirty-three feet, being almost double the length of those intestines in the horse. The want of mechanical obstruction to the passage of the food is thus made up by the increased length of the viscera. In the colon, the process of digestion may be considered to be in a manner terminated, and all that remains is fæculent matter, that continues to be urged on in order to be expelled.

THE RECTUM.

This intestine, so called from the straight course which it runs, terminates the digestive canal. It also has no longitudinal bands, for it contains little beside the excrement that is to be discharged, or that should least of all be detained. The lacteal absorbents may still be traced in this intestine, but it is probable that very little nutritive matter is taken up, although, from the occasional hardened state of the dung, it is possible that much fluid may be carried off.

A circular muscle, always in action, is placed at the termination of the rectum, in order to prevent its contents from being involuntarily discharged. Its power is just sufficient for the purpose; and it readily yields, when, by the pressure of the abdominal muscles and the diaphragm, the excrement is forced against it, in the voluntary efforts of the animal.

The contents of the rectum in cattle are essentially different from those that occupy the same intestine in the horse. They are semifluid—their nutritive qualities are nearly exhausted, and they are of very inferior value for agricultural purposes.

The scientific author of the treatise on "British Husbandry," in the Farmer's Series, p. 227, says, that "when used alone, cow-dung has been considered, in most cases, as nearly worthless. It has also been thought that the dung of milch cows is inferior to that of oxen; but this can only be attributed to their yielding milk, which probably deprives the dung of some portion of its richness, for when they are dried off and fattened there is no perceptible difference." He makes two quotations in illustration of the inferior quality of the cow-dung,—one from the Essex Report, vol. ii., p. 238, in which it is stated that "fifteen acres having been manured for beans, six with horse-dung, and nine with dung from the cow-yard, the six acres produced far more than the nine," and that "in an experiment made near Grantham, in Lincolnshire, on a poor dry soil, the manure from a horse-yard, and that from a yard where neat cattle were wintered, were

used separately for turnips, and the former was found to have greatly the advantage." He adds, however, that "mixed with other kinds of manure, it is exceedingly valuable; that although its effect upon the soil is slower and less powerful than that of horse-dung, it is more durable, and that upon sand and gravel, and a dry and warm soil, its cooling qualities render it of much service." The comparison which he draws in other respects, between the two kinds of dung will be found to be interesting and instructive.

THE DISEASES OF THE INTESTINES.

These, with the exception of diarrhœa, are seldom so acute or fatal as in the horse, but they are too numerous, and destroy too many of our cattle. Those which belong to the membranes that invest or line the intestines, and that are referrible to the greater part, or the whole, of their extent, will with most convenience first come under consideration. Those which affect only particular viscera, or parts of them, will naturally follow.

ENLARGEMENT OF THE MESENTERIC GLANDS.

It has been stated that there are numerous vessels, termed lacteals, opening on the inner coat of the intestines, in order to convey the chyle to the thoracic duct, so that it may mingle with and supply the waste of the blood. These little vessels, ere they reach the main trunk, pass through a glandular body, in which some unknown change is probably effected in the chyle. Some of these mesenteric glands are represented at *fig. 8*, page 467. These glands occasionally become unnaturally enlarged, and then, whether from the abstraction of so much nutriment, in order to contribute to this enlargement, or from this unknown change not taking place in the chyle before it mingles with the blood, or from the constitutional disturbance which the presence of such a body in the abdomen must produce, the animal ceases to thrive, his belly becomes enlarged, cough and consumption appear, and he gradually wastes away and dies. On examination after death, some of the mesenteric glands are of unusual bulk, and occasionally have grown to an enormous size.

Mr. Brown, of Melton, has recorded a case of singular enlargement of one of these glands*. He was sent for to examine a cow with considerable depression of countenance, the eyes shrunk in their orbits, the membrane of the nose and the mouth of a pale yellow colour, and the skin around the eyes, nose and mouth also presenting the same tinge. The pulse was quick, the breathing difficult, the belly swelled, and she could scarcely be induced to move. When the hand was passed along the right side, a large tumour could be distinctly felt, and which would not yield to pressure.

Mr. Brown very properly decided that the case was hopeless, and advised that she should be destroyed. She was, however, given up to him for experiment. He determined first to try the effect of mercury, and he gave her every night two scruples of calomel, with a drachm of hemlock, and half a drachm of opium; he also administered four ounces of Epsom salts every morning, in eight ounces of infusion of cascarilla. A more judicious plan of treatment he could scarcely have adopted. As soon as purging commenced, he omitted the internal medicine, shaved the hair from the right side, and well rubbed in daily an ounce of strong mercurial ointment with a drachm of camphor. This was continued for six days; but the patient continuing to lose flesh, and becoming so weak as not to be

* Veterinarian, Feb. 1830.

able to raise herself up when down, and the tumour not diminishing, he ordered her to be destroyed.

On opening the abdomen, the first thing that presented itself filling the iliac region was a large mesenteric gland, of irregular form, weighing 160lb. On making a section through it, its appearance was chiefly that of a schirrous deposit. The mesenteric glands generally were unhealthy, and many of them were schirrous. This case is a valuable one; it is the only one on record of schirrous enlargement of the mesenteric glands of the ox; but the recollection of every practitioner will furnish him with not a few instances of these tumours unexpectedly presenting themselves on examination of the abdomen. They have been found chiefly in young beasts that had been bred too much in and in, or that had been weakly from other causes, and particularly in those that had been subject to chronic cough, associated with tubercles in the lungs. In low and damp situations these tumours have been found on the mesentery of cattle that have been long unthrifty and out of condition, and that have at length died apparently in consequence of some other disease.

The association, however, with these diseases has differed so materially in different cases, and the symptoms have been so obscure, or so much resembling those of various and almost opposite complaints, that they have not yet been satisfactorily classed and arranged. This also must be the work of future veterinarians, and when cattle medicine begins to receive that attention which it deserves.

The treatment of these mesenteric enlargements, when they are suspected and pretty well ascertained, would be a course of mild purgatives, mingled with tonics (the Epsom salts with gentian and ginger, a dose sufficient to keep the bowels gently open being administered every morning), with the exhibition of from six to ten grains of the hydriodate of potash, at noon and night, and the removal of the animal to good and dry pasture.

INFLAMMATION OF THE BOWELS.

Of this malady, as in the horse, there are two species: the first is inflammation of the external coat of the intestines, accompanied by considerable fever, and usually by costiveness; the second is that of the internal or mucous coat, and generally attended by violent purging.

The first of these, designated by the term ENTERITIS, is, in most cases, sudden in its attack. Beasts of middle age,—strong,—in good condition, and particularly working cattle, are most subject to it. Calves, old beasts, and milch cows are comparatively exempt from it. The disease is most frequent in hot weather, and after long-continued drought.

The beast, that on the preceding day seemed to be in perfect health, is observed to be dull—depressed—his muzzle dry—his hair rough:—he shrinks when his loins are pressed upon, and his belly seems to be enlarged on the left side. To these symptoms speedily succeed disinclination to move—weakness of the hind limbs—trembling of them—staggering—heaving of the flanks—protrusion of the head—redness of the eyes—heat of the mouth and ears and roots of the horns, and a small, but rapid pulse, generally varying from 60 to 80 beats in a minute. Rumination has now ceased; the appetite is lost; the fæces are rarely voided, and are hard and covered with a glazy mucus, and that mucus is sometimes streaked with blood;—the animal also moans with intensity of pain.

These symptoms rapidly increase; the patient becomes more depressed; the pulse more feeble; the moaning incessant, and the beast is continually down. He becomes half unconscious, and is evidently half-blind;

the mouth is filled with foam, and the tongue is covered with a brownish yellow deposit. There is grinding of the teeth, and difficulty in the swallowing of liquids; a tucked up appearance of the belly, mingling with the enlargement of the left flank,—and the whole of the belly is exceedingly tender. Until he is too weak to raise himself, he is exceedingly restless, lying down, and immediately getting up again, and with convulsive movements of the muscles of the neck and extremities. The evacuation of the fæces is entirely suppressed, or a little stream of liquid excrement forces a passage through the hardened mass by which the rectum is distended, and that which is voided has an exceedingly fœtid and putrid smell. This symptom is characteristic. The person who is accustomed to cattle says, that the beast is *fardel-bound* or *sapped*, but he often mistakes the nature of the case, and fancies that diarrhœa instead of costiveness exists. The urine becomes thick and oily and brown, and has a peculiarly disagreeable and penetrating smell. As the disease proceeds, the weakness and suffering increase, until the animal dies, sometimes exhausted, but mostly in convulsions, and frequently discharging a bloody fœtid fluid from the mouth, the nose, and the anus.

Sometimes, when the disease has not been attacked with sufficient energy, and oftener in despite of the most skilful treatment, other symptoms appear. The animal seems to amend; the pulse is slower and more developed—rumination returns—the patient eats a little—the enlargement of the flanks subsides—the excrement, whether hard or fluid, is more abundantly discharged: but the beast is sadly thin—he is daily losing ground—his coat stares—the hair is easily detached—the skin clings to the bones—he is sometimes better, and sometimes worse, until violent inflammation again suddenly comes on, and he is speedily carried off*.

On examination after death the first thing that presents itself is the engorgement of the sub-cutaneous vessels with black and coagulated blood, and the discoloration of the muscles, softened in their consistence and becoming putrid. The abdomen exhibits the effusion of a great quantity of bloody fluid; eight, ten, and twelve gallons have been taken from it. The peritoneum is inflamed—almost universally so;—there are black and gangrenous patches in various parts, and on others there are deposits of flaky matter, curiously formed, and often curiously spotted. The liver is enlarged and its substance easily torn; the rumen is distended with food, generally dry, and its lining membrane inflamed and injected, and of a purple or blue tint: the reticulum does not escape the inflammatory action; the manyplus is filled with dry and hard layers which cannot be detached without difficulty from the mucous membrane of that stomach; the fourth stomach is highly inflamed, with patches of a more intense character, and its contents are liquid and bloody, particularly towards the pyloric orifice. The small intestines contain many spots of ulceration, the lining membrane is every where inflamed, and they are filled with an adhesive or bloody mucous fluid; the larger intestines are even more inflamed, they exhibit more extensive ulceration, and contain many clots of effused blood. The rectum is ulcerated and gangrenous from end to end.

* Hurtrel D'Arboval, in his "Dictionary of Veterinary Medicine and Surgery," thus describes some of the symptoms in a more than usually aggravated case. "The convulsive movements were exceedingly violent. The animal, seemingly afraid of every thing around him, dragged himself along, and beat himself about in every direction, uttering the most frightful lowings. His tongue, red and swelled, hung from his mouth; the nostrils were dilated; the eyes haggard and full of tears; all the mucous membranes were of a scarlet red; the ears and horns were burning, as also was the whole surface of the body. The beatings of the heart were violent and rapid, yet the pulse was scarcely perceptible, and no blood could be obtained from the jugular."

There is usually considerable effusion in the chest; the coverings of the lungs are inflamed; the bag of the heart more so; the substance of the lungs is sometimes emphysematous, and at other times gorged with blood, and the heart is marked with black spots outwardly, and in its cavities. The lining membrane of all the air-passages is of a red brown colour; the larynx and the pharynx are intensely red, and so is the membrane of the gullet.

Of the causes of this disease it is difficult to speak. It seems occasionally to be epidemic, for several instances of it occur of the same character, and in the same district. M. Creuzel gives an illustration of this in his description of the disease that destroyed so many cattle in the years 1826 and 1827, in the department *de la Nièvre*. Out of 218 cattle belonging to three farmers, 113 were attacked by the disease, and 83 of them died. One farmer, in a neighbouring district, had 19 head of cattle, all of whom sickened, but only three of them were lost. These were unusually hot summers. The upland pasture was burnt up, or what remained of it was rendered unusually stimulating; and the acrid plants of the marshes and low grounds acquired additional deleterious agency*.

When isolated cases occur, they may generally be attributed to mismanagement. Exposure to cold, or the drinking of cold water when heated with work; too hard work in sultry weather; the use of water stagnant, impure, or containing any considerable quantity of metallic salts; the sudden revulsion of some cutaneous eruption; the crowding of animals into a confined place; too luxuriant and stimulating food generally; and the mildewed and unwholesome food on which cattle are too often kept, are fruitful sources of this complaint.

WOOD-EVIL, MOOR ILL, PANTAS.

These are but varieties of the same disease, frequently produced, as the first name would import, by browsing on the young buds of trees, and particularly on those of the ash and the oak. These buds are tempting to cattle at the commencement of the spring, but they are of too acrid and stimulating a character to be eaten with impunity in any considerable quantities. Heat of the mouth and skin—redness of the membranes—thirst—obstinate constipation—hardness of the little fæces that are expelled—the covering of them with mucus and blood—difficulty of voiding urine, and its red colour and penetrating odour—colicky pains—depression,—are the characteristic symptoms of this disease.

Some veterinarians give the name of wood-evil to complaints allied to rheumatism, or being essentially rheumatic; others consider it to be a disease of debility, looking to the consequence of inflammation, and not to the inflammation itself. If any distinction were drawn between wood-evil and enteritis in cattle, it would be, that although in wood-evil there seems to be more affection of the head, and the animal appears now and then as if it were rabid, there is not so much intestinal inflammation, and the disease does not so speedily run its course†. Wood-evil may last from twelve to twenty days.

* Rec. de Méd., Oct. 1828, p. 243.

† M. Girard observed in 1816, a similar disease among the cows in a village near Brie. At the commencement the animals were dull, disinclined to eat, spume dropped from the mouth, and the spine was tender. There ran from the vagina of the cow a bloody matter, of a peculiar smell, which the urine also possessed. The constipation was obstinate; the dung was hard and in pellets, and covered with streaks of blood. The animal remained in this state twenty-four hours, after which the bloody evacuations ceased; the patient became palsied behind; violent diarrhœa followed, foetid, and infectious, and the patient was presently lost.—*D'Arboval, Dict. de Vét. Méd.*

The prognosis, or expectation of the termination of the disease is always unfavourable when after a certain time much fever comes on, or the costiveness will not give way, or the urine is thick or bloody, or the disease attains its full intensity in the space of a few days. Then, instead of terminating in resolution, the inflammation runs on to gangrene; all the acute symptoms suddenly disappear, and death is not far distant. On the other hand, the result will be favourable when the disease does not reach that degree of intensity of which it is capable; when, after a few days, the symptoms gradually disappear, and the animal regains his former habits, and the excrement resumes its natural form and consistence*.

The history that has been given of this disease will leave little doubt respecting the course of treatment that should be pursued. A malady of so intensely an inflammatory character should be met by prompt and decisive measures; and to them it will, in its early stage, generally yield. Nothing is so easy as to give relief to a sapped or fardel-bound beast, before he begins to heave at the flanks or ceases to ruminate; but quickness of breathing, and heat of the mouth, and evident fever, being once established, the animal will probably be lost.

The patient should be bled. If it is simple costiveness without fever, the abstraction of six or eight quarts of blood may suffice; but if the symptoms of inflammation cannot be misunderstood, the measure of the bleeding will be the quantity that the animal will lose before he staggers or falls. Purgatives should follow—the first dose being of the full strength, and assisted by quickly repeated ones, until brisk purging is produced. Hot water, or blisters, should be applied to the belly, and the food of the beast should be restricted to gruel and mashes. This will, in most cases, include the whole of the treatment.

If other symptoms should arise, or other parts appear to be involved, the practitioner will change his mode of proceeding accordingly; but he will be cautious how he gives aromatics or tonics, until he is convinced that the state of fever has passed over, and circumstances indicate the approach of debility and of typhus fever.

DIARRHŒA AND DYSENTERY †.

The frequent and abundant evacuation of fæcal matter, whether with or without mucus, may be considered either as simple, or connected with other diseases. In its former state it will be the subject of present consideration, and may be regarded as acute or chronic. Acute diarrhœa may be produced by various causes;—the abuse of purgatives, by their being administered in too active a form—feeding on certain poisonous plants—sudden change of food, generally from dry to green aliment, but occasionally from green to dry—excess of food—the drinking of bad water—or by some humid and unhealthy state of the atmosphere. From the last cause it usually assumes an epizootic character, particularly in autumn. A great many cows in a certain district are suddenly attacked by it, although there is no reason to suspect that it is in the slightest degree contagious.

Calves and milch cows are far more subject to this species of intestinal inflammation than are full grown or working oxen.

The proper treatment of acute *diarrhœa* will consist in the administra-

* D'Arboval, Dict., Article *Enterité*.

† The distinction between these two diseases, and it is of essential importance to observe it in the treatment of cattle, is, that diarrhœa consists in the evacuation of fæcal matter, in an undue quantity, and more than naturally liquid form. In dysentery, more or less mucus, or mucus and blood combined, mingles with the fæces.

tion of a mild purgative, in order to carry off any source of irritation in the intestinal canal; the abstraction of blood, if there is any degree of fever, and in proportion to that fever; and then the exhibition of alkalis and astringents. The most effectual medicines are prepared chalk, opium, catechu, and ginger, in the proportions of one ounce of the first, one drachm of the second, four drachms of the third, and two of the last in each dose, and to be administered in thick gruel.

This will generally be successful: but, occasionally, these acute cases of diarrhœa are obstinate and fatal; and too often it happens that what has been represented to the practitioner as a sudden attack turns out to be the winding up of some chronic disease, and he does not discover the mistake until it is too late.

Diarrhœa is not always to be considered as a disease. It is often a salutary effort of nature to get rid of that which would be injurious; or it is a somewhat too great action of certain of the digestive organs, which soon quiet down again to their natural and healthy function. An occasional lax state of the bowels in calves is known to be favourable to the acquirement of fat; and a beast that is well purged on being first turned on spring-grass or turnips thrives far more rapidly than another that is little, or not at all, affected by the change. Diarrhœa, in some critical stages of disease, is to be hailed as the precursor of health, rather than feared as the attack of a new malady; it should be so in pneumonia, red water, and puerperal fever. All that is then to be done is to prevent its becoming so violent as to depress the vital energies. Diarrhœa may assume a chronic form, with greater or less severity, and producing loss of condition and debility; it may be prolonged for many a month, and even for years, and at length terminate fatally. This is often the case with cows that have been drained of their milk and badly kept. The diarrhœa of calves will be considered when the diseases of those animals come under notice.

The treatment of chronic diarrhœa is difficult, and unsatisfactory. Purgatives cannot be dispensed with, but they must be administered with considerable caution. Both the medicine and the quantity should be well considered, for if the aperient is not strong enough, the disorder will be increased and prolonged; and if it is too strong, both these effects will be produced to a greater extent, and fatal inflammation and superpurgation may ensue. Castor oil will be the safest, and the most effectual medicine, in doses from a pint to a bottle; and a small quantity, ten grains, of powdered opium, will not interfere with the aperient quality of the oil, while it may allay irritation. After two doses of the oil have been given, the powder already recommended may be tried, but with a double quantity of ginger, and half a drachm of powdered gentian. After a while, a drachm of the Dover's powder may be given, morning and night; and, that also ceasing to have effect, the first powder may again be administered. Alum whey is often of considerable service. If the animal is turned out, it should be on the driest pasture, but it will be better for her to be kept up with plenty of hay, and gruel to drink.

It is, however, with DYSENTERY that the practitioner is most loth to cope, a disease that destroys thousands of our cattle. This also may be either acute or *chronic*. Its causes are too often buried in obscurity, and its premonitory symptoms are disregarded or unknown. There appears to be a strong predisposition in cattle to take on this disease. It seems to be the winding up of many serious complaints, and the foundation of it is sometimes laid by those that appear to be of the most trifling nature. It is that in cattle which glanders and farcy are in the horse—the breaking up of the constitution.

Dysentery may be a symptom and a concomitant of other diseases. It is one of the most fearful characteristics of murrain; it is the destructive accompaniment or consequence of phthisis. It is produced by the sudden disappearance of a cutaneous eruption; it follows the cessation of chronic hoose; it is the consequence of the natural or artificial suspension of every secretion. Were any secretion to be particularly selected, the repression of which would produce dysentery, it would be that of the milk. How often does the farmer observe that no sooner does a milch cow cease her usual supply of milk than she begins to purge! There may not appear to be anything else the matter with her, but *she purges*, and in the majority of cases that purging is fatal.

It may, sometimes, however, be traced to sufficient causes, exclusive of previous disease. Unwholesome food—exposure to cold—neglect at the time of calving—low and marshy situations—the feeding on meadows that have been flooded (here it is peculiarly fatal)—the grazing (according to Mr. Leigh, and our experience confirms his statement) upon the clays lying over the blue lias rock—the neighbourhood of woods, and of half stagnant rivers—the continuation of unusually sultry weather—overwork, and all the causes of acute dysentery may produce that of a chronic nature—or acute dysentery neglected, or badly, or even most skilfully treated, may degenerate into an incurable chronic affection. Half starve a cow, or overfeed her; milk her to exhaustion, or dry her milk too rapidly, dysentery may follow.

The following may probably be the order of the symptoms, if they are carefully observed. There will be a little dulness or anxiety of countenance, the muzzle becoming short and contracted—a slight shrinking when the loins are pressed upon—the skin a little harsh and dry—the hair a little rough—there will be a slight degree of uneasiness, and shivering, that scarcely attracts attention—then (except it be the degeneracy of acute into chronic dysentery) constipation may be perceived—it will be to a certain degree obstinate—the excrement will be voided with pain—it will be dry, hard, and expelled in small quantities. In other cases, perhaps, purging will be present from the beginning; the animal will be tormented with tenesmus, or frequent desire to void its excrement, and that act attended by straining and pain, by soreness about the anus and protrusion of the rectum; and sometimes by severe colicky spasms. In many cases, however, and in those of a chronic form, few of these distressing symptoms are observed even at the commencement of the disease, but the animal voids her fæces oftener than it is natural that she should, and they are more fluid than in a state of health; but at the same time, she loses her appetite and spirits and condition, and is evidently wasting away.

In acute cases, if the disease does not at once destroy the animal, the painful symptoms disappear, and little remains but a greater or less degree of dulness, disinclination to food, rapid decrease of condition, and frequent purging. The fæces are often voided in a peculiar manner; they are ejected with much force, and to a considerable distance, and the process of *shooting* has commenced. The fæces, too, have altered their character; a greater quantity of mucus mingles with them; sometimes it forms a great proportion of the matter evacuated, or it hangs in strings, or accumulates layer after layer under the tail. The farmer and the practitioner anxiously examine the evacuation. As the thin mass falls on the ground, bubbles are formed upon it? They calculate the time that these vesicles remain unbroken. If they burst and disappear immediately, the observer does not quite despair: but if they remain several minutes on the

surface of the dung, he forms an unfavourable opinion of the case, for he knows that these bladders are composed of the mucus that lined the intestines, and which is not separated from them except under circumstances of great irritation; or which being thrown off, the denuded membrane is exposed to fatal irritation. In this state the beast may remain many weeks, or months; sometimes better, and sometimes worse; and even promising to those who know little about the matter, that the disease will gradually subside. The farmer, however, has a term for this malady, too expressive of the result, although not strictly applicable to what is actually taking place within the animal. She is *rotten*, he says, and she dies as if she were so.

The writer of this treatise will not say, with one well-informed and skilful practitioner, that "chronic diarrhœa invariably wears the animal down, sooner or later, in spite of all means*," nor with another, that "the animal loses its flesh, becomes exceedingly thin, and ultimately dies in despite of any treatment; and in this stage the cow-leeches have each their favourite specific, the only good of which consists in the money they can obtain for it†." There are cases of recovery, but they are few and far between.

In most cases the tragedy gradually draws to a close. The beast is sadly wasted—vermin accumulate on him—his teeth become loose—swellings appear under the jaw, and he dies from absolute exhaustion; or the dejections gradually change their character—blood mingles with the mucus—purulent matter succeeds to that—it is almost insupportably foetid—it is discharged involuntarily gangrenous—ulcers about the anus sometimes tell of the process that is going on within; and, at length, the eyes grow dim and sunk in their orbits, the body is covered with cold perspiration, and the animal dies.

In some cases the emaciation is frightful; the skin cleaves to the bones, and the animal has become a living skeleton; in others there have been swellings about the joints, spreading over the legs generally, occasionally ulcerated; and in all, the leaden colour of the membranes, the rapid loss of strength, the stench of the excrement, and the unpleasant odour arising from the animal himself, announce the approach of death.

The appearances after death are extraordinarily uniform, considering of how many diseases this is the accompaniment or the consequence, and the length of time that it takes to run its course, and during which so many other organs might have been readily involved. The liver is rarely in any considerable state of disease. The first and second stomachs are seldom much affected; the third stomach presents a variable appearance with regard to the state of the food that it contains, and which is sometimes exceedingly hard, and sometimes almost pultaceous, but there is no inflammation about the stomach itself. The fourth stomach exhibits a peculiar change: there is an infiltration or collection of serous fluid in the cellular substance between the mucous and muscular coat, showing some, but no very acute degree of inflammation in the submucous tissue. The small intestines are frequently without a single trace of inflammation, but sometimes, however, they are thickened and corrugated, but not injected. It is in the cæcum, colon, and rectum, that the character of the disease is to be distinctly and satisfactorily traced.

Mr. Cartwright, describing the morbid appearances in a beast that had died of dysentery, says "that the colon and cæcum were inwardly of a dirty colour, with blackish streaks running over them in every direction,

* Mr. Farrow.—*Veterinarian*, June, 1831, p. 316.

† Mr. Hales.—*Ibid.* August, 1831, p. 438.

The parietes were very thin, without the least covering of mucus. The liver was the smallest I ever saw. It was perfectly sound, of a uniform clear light-blue colour, and firm in texture*." In a subsequent communication †, he narrates the lesions of some other beasts that had been under his treatment. He thus speaks of the first case—"The plaits upon the fourth stomach were about an inch thick, and underneath the secreting coats there was contained a quantity of serum and lymph, which had the appearance of jelly ‡. The cæcum had two or three small abscesses just under the inner coat, but which had not burst, and many places of it were marked with black streaks. The whole of the abdominal cavity was very white, and infiltrated with serum." In the second case, he states, that "the plaits on its internal surface were much filled with serum, and which would gravitate when held in different positions. On the villous coat of the *large* intestines, and throughout them, were a great many reddish spots, and in other places there were whole patches of the same; and on wiping this red secretion off, the coat was found to be abraded or ulcerated, and the intestines between those spots were thickened §."

* Veterinarian, Feb. 1829, p. 71. † Ibid. Dec. 1831, p. 669.

‡ Mr. Farrow also has noticed these serous depositions between the coats of the stomach.—*Veterinarian*, June, 1831, p. 316

§ It may not be uninteresting to give a short sketch of the symptoms and appearances after death, of dysentery in the human subject. Its identity with the rottenness of cattle will not be for a moment doubted. The quotation is selected from that most valuable work "The Cyclopædia of Practical Medicine," article Dysentery, by Dr. Joseph Brown.

"A case of this description may commence with feculent and liquid stools, and they may subsequently become mucous, with occasionally a slight admixture of blood, or they may be of the latter character from the beginning. There is little, if any, fixed pain in the abdomen, but considerable griping during the evacuation, and heat of the anus, with distressing straining. The dejections, however, do not exceed seven or eight times in the day. Difficulty of breathing and of voiding the urine attend severe cases of the disease. The appetite is generally impaired—the thirst considerable, and the tongue is sometimes furred. The mean duration of this slight form of the disease is from seven to eight days: it may be said to be never fatal, but it not unfrequently lays the foundations of chronic dysentery, and often leaves such a tenderness of the bowels, as renders them more prone than before to morbid action, from cold or other causes.

"A more intense form of the disease will be found of frequent occurrence when dysentery is prevailingly epidemic. Occasionally a well-marked rigor (shivering fit), followed speedily by febrile heat, introduces the disease, while in other cases the first symptom is pain in the bowels, to which the mucous stools, characteristic of dysentery, in a short time succeed. In many instances, some slight derangement of the stomach or bowels, indicated by flatulency, costiveness, inappetency, and nausea, is experienced. When the disease is fully formed, the characteristic mucous, or muco-sanguinolent stools are passed very frequently, with great pain, and an extreme degree of straining. There is a warm skin—a hard, generally frequent and small pulse—the tongue is either covered with a white mucous coat, or it is dark and dry—there is great prostration of strength, and the urine is scanty and high-coloured, and is passed with pain and difficulty. The griping which *precedes* each evacuation is very distressing.

"Should no relief be afforded by the remedies employed, the prostration of strength becomes great, the pulse feeble, with coldness of the extremities, the tongue either furred and brown, or glazed and red; the discharges from the intestines are dark and offensive; the mind is low and desponding, and death sometimes takes place in a period varying from a fortnight to three weeks from the commencement of the attack: but much more frequently, even in bad cases, some mitigation of the symptoms is obtained, and the disease degenerates into a chronic form.

"Restoration to health may be expected when there is diminution of pain in the abdomen, of straining, and of the frequency of discharges, and especially, if, instead of the mucous or muco-sanguinolent dejections, the stools become natural. An abatement of the febrile symptoms, and thirst, and a return of appetite, are all favourable symptoms: but all favourable symptoms are to a certain extent fallacious, for, after a truce of a few days, we may discover that we have that insidious and slowly wasting disease, chronic

Hurtrel D'Arboval, when describing the disease under the names of diarrhœa and dysenteric enteritis, thus writes of the first variety: "The mucous membrane of the large intestines is more or less red and thickened, offering sometimes erosions, and at other times characters of extravasation of blood, or being black, without consistence, and diffusing a noisome odour." Of the second he says, "there was more considerable thickening of the mucous membrane, with different shades of redness, and frequent deep ulcerations. The muscular coat of the intestine was untouched, and presented a sort of floor for the ulcerations. These ulcers were more numerous in the rectum, and towards the curvature of the colon, than in any other part of the large intestines; many other organs presented some morbid change, in proportion as they had participated more or less in the inflammation, but they were only secondary changes, and deserved little attention."

The account of these *post mortem* appearances is given at considerable length, because they clearly indicate the hitherto unsuspected nature of the disease,—unsuspected at least among veterinarians; and they will probably lead to a mode of treatment that promises a little more success than has hitherto attended the efforts of practitioners. It is plainly *inflammation* (at first acute, but gradually assuming a chronic, a more insidious and

dysentery to combat. Chronic dysentery may be considered as almost a more distressing termination of the acute form than death itself, for recoveries from it are rare. The fever which attends the acute form subsides, and a temporary recruiting of strength and appetite is experienced, but this truce from distress proves deceptive. The patient occasionally feels sharp pains of the bowels, with frequent stools, consisting of food apparently little changed by the process of digestion, mixed with slight streaks of blood: these symptoms may subside and continue to occur at intervals, either from some manifest imprudence in regimen, or without any assignable cause, until extensive disorganization of the intestine takes place. The stools are then mucous and bloody, sometimes mixed with purulent matter, varying from three or four, to seven or eight times in the day—the abdomen feels full and hard, and without being very painful on pressure—the urine is high-coloured, and is passed with pain. The patient when in bed lies on his side, with his body much curved, so as to relax the muscles of the abdomen as much as possible. The pulse is feeble, intermitting, and generally slow; the skin is cold, sallow, dry, and rough; emaciation proceeds rapidly, the feet and legs become œdematous, and ascites occasionally takes place; the patient sometimes becomes jaundiced, and finally, after the lapse of weeks or months, he sinks from irritation and exhaustion.

"The pathological appearances vary according to the period of death, and the nature of the case. If dysentery prove fatal in an early stage, the appearances are those of inflammation simply, or of inflammation and gangrene of the mucous membrane of the large intestines, with few or no traces of inflammation. If at a more advanced period, the other coats of the bowels are found to participate in the disease, and numerous and extensive ulcers are discovered. The external appearance of the bowel is healthy, but on opening it, portions of its mucous membrane throughout the whole extent of the colon and rectum, and occasionally some part of the small intestines, are found of a bright red and brownish colour, and sensibly elevated above the level of the more healthy parts. These inflamed portions are sometimes covered with a puriform, sanguineous, or sanious secretion, which gives them the appearance of ulceration, but if this is scraped off with the back of a scalpel, the surface is found unbroken.

"In cases which have terminated fatally in a more chronic way, there is thickening of the tunics of the intestine, and the bowel is contracted in diameter and ulcerated. The ulcers are diffuse or follicular. The former may be of the size of a sixpence or a shilling, or an extensive portion of the membrane may be in a state of almost continued ulceration, the diseased surface being varied by portions in a state of red fungous elevation running irregularly over it. The ulceration occasionally perforates the coat of the intestine so as to allow its contents to escape into the cavity of the abdomen. Adhesion to the neighbouring viscera and serous effusion into the cavity of the abdomen are not unusual occurrences.

"The mesenteric glands are sometimes enlarged—the liver is occasionally found small and indurated, or enlarged and at the same time of a firmer consistence than natural, or an abscess has been formed in it, but changes in its structure are much less frequent than was imagined, and by no means essential to dysentery."

dangerous form) of the large intestines, the colon, cæcum, and rectum ; it is the dysentery of the human being ; it is that which was once the scourge of the human race, but thousands of whose victims are now rescued from its grasp by the discovery of its real seat and character, and the adoption of those measures which such a disease plainly indicates.

If this malady is of an inflammatory type, the first, and most obvious, and most beneficial measure to be adopted is bleeding ; and this regulated by the age, size, and condition of the beast, the suddenness and violence of the attack, and the degree of fever. From two to five or six quarts of blood should be abstracted. There must be very great debility—the disease must in a manner have run its course, or the practitioner will be without excuse who, in a case of inflammation of the large intestines, neglects the abstraction of blood. General bleeding—bleeding from the jugular—will be of service, as lessening the general irritation, and the determination of blood to the part ; but in this case the practitioner can in some measure avail himself of the advantage of local bleeding, for by opening the subcutaneous or milk vein he takes blood from the parietes of the abdomen, and from that portion of them which is nearest to the inflamed part.

The repetition of the bleeding must depend on circumstances, of which the practitioner will be the best judge.

If this has not been the common practice in the treatment of dysentery, it must be attributed to the disgraceful state of veterinary education so far as cattle are concerned, in consequence of which so few persons have been aware of the nature of the disease. The author, however, is happy to be enabled to refer to Mr. Sorby, (with whose present residence he is unacquainted,) to Mr. Storry, of Pickering, to Mr. Baker, of Reigate, and to his friend Mr. Dickens, of Kimbolton, as having long, and with evident advantage, had recourse to this best antagonist of inflammation.

As another abater of inflammation, the veterinary surgeon will next administer a mild aperient. A little consideration will show that this is not contra-indicated even by the degree of purging which then exists ; for the retention of matter, such as that discharged in dysentery, must be a far greater source of irritation than the stimulus of a mere laxative.

The kind of medicine is a consideration of far more consequence than seems to be generally imagined. There would be a decided objection to the aloes so frequently resorted to in these cases : there would be some degree of doubt respecting that excellent and best medicine for general purposes, the Epsom salts. Both of them might add to the excessive irritation which the practitioner is so anxious to allay. Castor oil will here, as in acute diarrhœa, be decidedly preferred, and in the same doses. Some judgment will be required as to the repetition of the purgative. Its object is the simple evacuation of morbid fæcal matter, and not the setting up of any permanently increased action of the bowels : therefore, if instead of the comparatively scanty and mucous discharges of dysentery, a fair quantity of actual fæces has been brought away, there can be no occasion for, or, rather, there would be objection to, the continuance of the purgative. The author could refer to many a practitioner, justly held in estimation by the agriculturist and by his brethren, for testimony to the beneficial effect of mild aperients in the early treatment of dysentery. They may differ, they may a little err in the choice of the purgative, but they unite in the principle. The names of his friend Mr. Sewell, of Brighton, Mr. Baker, of Reigate, Mr. Nobbs, of Cattistock, and Mr. Sorby, immediately occur to him. Mr. Baker gives linseed oil, which certainly stands next in value to the castor oil as an aperient, when the bowels are in an irritable state.

This being inflammation of the large or lower intestines, there will be evident propriety in the administration of emollient injections. These intestines, although longer than in the horse, are not so capacious as in this animal; and they have not that irregular and cellated structure, which prevents the injected fluid from filling, or even reaching them to any extent. By means of the newly invented enema-pump, the intestines in the ox, which are the seat of this disease, may be completely filled with some emollient fluid; and that which is most of all indicated here, and especially in the early stage of treatment, is gruel, well-boiled and thick; a pailful of it may be thrown up with advantage two or three times every day.

Let it now be supposed that this treatment has been pursued two or three days;—if the discharges are more fæcal, a little greater in quantity, and attended by less pain or less effort in the expulsion of them, that purpose has been effected which the practitioner was anxious to accomplish, and he must look about for other measures; or, if the state of the animal remains the same, it will be useless longer to pursue this plan. Then the surgeon refers once more to the character of the malady—inflammation of the mucous membrane of the large intestines—and he asks what he can bring in direct contact with the diseased surface, that is likely to allay irritation or to abate inflammation. He does not long hesitate here. Opium immediately presents itself, at once an astringent and an anodyne—an astringent, because it is an anodyne—and he determines to give it in doses of half a drachm, and in the best form in which it can be administered, namely, in that of powder, mixed with thick gruel. He likewise adds it to the gruel of the injection, either under the form of powder, or he boils a few poppy-heads in water, and then causes the gruel to be made with the decoction.

Here all practitioners seem to agree. Whether they prepare the way for the opium by the administration of an aperient, or whether, deceived by the state of purging, they give it at once, they are all anxious to try the power of this drug; but too many of them, either forgetting or not knowing the nature of the disease, add medicines of an opposite character, and that cannot fail of being injurious. They administer astringents and tonics, which are useful and indispensable in a later stage of the treatment, but, while the inflammation remains unsubdued, are only adding fuel to fire. There are too many practitioners who scruple not to give alum and sulphate of zinc as soon as they are called in to such a case; and before the lining membrane of the intestines is prepared for their action. These drugs are acrid—they are caustic as well as astringent—they are astringent because they are caustic, and they too frequently set up another and destructive inflammation. No better illustration than this would be required of the lamentable consequence of the utter neglect of the diseases of cattle in the system of veterinary instruction south of the Tweed. When will agriculturists and agricultural societies awake to a sense of their true interest?

It is usual, however, to add something to the opium, in order to increase or to regulate, or to modify its power; and that which is without comparison the most serviceable is one of the mild preparations of mercury, viz. calomel, or the blue pill, or mercury triturated with chalk. Mere theory might induce the fear that mercury would add to the irritation already too unmanageable, and so it would, if given alone; but, combined with and guarded by the opium, it has the most beneficial effect: the opium does not produce costiveness,—the calomel does not gripe and purge, but irritation is allayed, while the natural action of the bowels is promoted.

Mr. Dickens gives calomel and opium. In a letter with which he

favoured the author, in 1831, he says, "This disease has been very prevalent in our neighbourhood this spring, and I have been tolerably successful in the treatment of it. I at first administered the various astringents, as chalk, kino, opium,—but, much to my disappointment, I found little or no good effect from them. I then administered one drachm each of calomel and opium in some good thick gruel, which I consider of the greatest importance, acting as a sheath to the intestines, already under a state of excitement. I repeat this according to the size of the animal, and the violence of the disease, but I have rarely had occasion to repeat the dose more than twice in the course of three or four days, continuing to give the gruel in the interval; but I ought to state, that if the disease is of recent date, or what Mr. Blaine calls acute, I always bleed."

Mr. Sewell also gives calomel, but without the opium. He, with his usual openness and humour, thus describes his practice, and at the same time shows the injurious and undeservedly low estimation in which veterinary surgeons are held by many farmers, and in which they will be held until the public are assured that they are competently instructed in the treatment of neat cattle:—"I have frequently seen bullocks at farm-houses, (when I have been attending a horse for the owner,) that have been a long time ill with diseased liver and constipated bowels, and been under the treatment of what they call a skilful cow-leech, who has at length given them up as incurable, and the animals have been, comparatively speaking, wasted to skin and bone. I have now and then asked the farmer to allow me to undertake the case; I have given calomel, aloes, and sulphate of soda; I have brought the liver into action by repeating my doses at intervals, and keeping the animal upon bran-mashes and linseed; and he has recovered, returned to his work, and afterwards grazed and fatted as well as any other beast. Yet the very men for whom I have done these things, when they have fresh cases, send for the cowleech in preference to me."*

The author will not again contest with his scientific friends the question on which his opinion has been already freely stated respecting the nature and seat of this disease—inflammation of the large intestines, and no necessary affection of the liver—but he is happy in being enabled to add his decided experience of the efficacy of mercurial preparations in this malady.

Mr. Meyer gives a favourable report of the blue pill, combined with Dover's powder (a preparation of opium with ipecacuanha): but the author very much doubts whether either of these medicines, although excellent in human dysentery, is sufficiently powerful for cattle; and acknowledges that he gives the preference to calomel and simple opium.

In order that this mode of treatment may have a fair chance, the beast should be housed and fed on bran-mashes, a little hay, and plenty of well-boiled gruel. While the patient continues at grass the practitioner has no chance, however skilful in other respects his treatment may be. So much depends on the avoidance of all green and succulent food, that many a beast, from whom every symptom of dysentery had disappeared, has relapsed, and been lost, from having been turned out too soon. The green food of one day has produced irreparable mischief.

There are other auxiliary measures which deserve consideration. Setons in the dewlap have been strongly recommended. They may be useful when much fever accompanies the early stage of dysentery, for they will in some measure, divert the current of blood from the inflamed and irritated part, and thus lessen the local inflammation and discharge, and also the general fever; but no very material degree of benefit can be expected

* Veterinarian, Sept. 1831, p. 511.

from them ; and there certainly cannot be that importance which is sometimes attached to the substance, or the root that is inserted. There is no peculiar virtue in the bearsfoot, on which so much superstitious confidence has been placed ; the common cord, or hair-rope, will answer every purpose : the black hellebore root, however, produces the speediest inflammation and the most copious discharge.

Fomentation of the right flank and the right side of the belly with hot water, or, in acute cases, the blistering of those parts will be far more serviceable than any seton in the dewlap can possibly be.

That admirable disinfectant, the chloride of lime, promises to be of essential service in the treatment of dysentery ; not only in changing the nature of the intestinal discharge, and depriving it of all its putridity, but in disposing the surface of the intestine, with which it may be brought into contact, to assume a more healthy character. When applied externally to wounds and ulcers of every kind it effects wonders in both of these respects ; and, being properly diluted, it has not been found to give any great pain, or dangerously to increase inflammation in the most irritable ulcer. It may be administered either by the mouth, or in the form of clyster. The practitioner will probably avail himself of its aid in both forms. It should not be mingled with any other drug ; but half an ounce of the solution, or a drachm of the powder, may be mixed with a quart of water, and given between the regular periods for the administration of the other remedies.

The reader will forgive a repetition of the caution as to the mode of administering liquid medicine to cattle ; for in a disease so serious and so fatal as dysentery it cannot be too deeply impressed on the mind of the practitioner. Whether the medicine is given by means of a horn or the pump, it should flow as gently as possible down the gullet, that it may not break through the floor of the œsophagean canal, but have a better chance of passing on to the fourth stomach and the intestines.

In this, as well as in the chronic stage of dysentery, a great deal more depends upon attending to the comfort of the animal than too many seem to believe. The patient should be housed, and well littered down, and, in some cases, moderately clothed. Of his food, little portions at a time should be culled for him and offered to him ; and warm gruel and warm mashes should be frequently put within his reach. The author will not go so far as J. E. (Ellman) in the survey of Sussex, who, perhaps disgusted with the ignorance of the cow-leech, and the recklessness with which he pours in his drugs, says, "If any of my cattle get into a low weak state I generally recommend nursing, which, in most cases, is much better than a doctor ; having often seen the beast much weakened, and the stomach relaxed, by throwing in a quantity of medicine injudiciously, and the animal lost ; when, with good nursing, in all probability it might have been otherwise ;" but there can be no doubt that more benefit is connected with that one word *comfort*, than can be procured from half the drugs which the veterinary pharmacopœia contains.

In many cases, and in every case that can be brought to a successful termination, it will be observed, after the perseverance of ten days or a fortnight in this mode of treatment, that the pain preceding and accompanying the evacuations is materially lessened, and that the nature of the matter evacuated is changed. The stools will probably be as frequent ; they will be more copious ; but less mucus will be found in them, and they will have become more decidedly fæcal and not so offensive. The belly will be less tender ; the countenance less anxious ; the general appearance improved. The inflammation of the inner surface of the large

intestines will have materially subsided, but the habit of purgation will continue for a while, and will be increased by the state of relaxation and debility in which the vessels are left. Then, but not until then, astringents will be admissible and highly beneficial.

Catechu stands at the head of this class of medicines in such a case; and its power may be increased by the addition of oak bark, or it may be given in a decoction of oak bark. The opium must not, however, be omitted; for although direct inflammation may have been subdued, and relaxation and debility have followed, much irritability may remain, to control which the soothing power of opium will be required.

To catechu and opium it has been usual to add chalk; for in all these diseases there is a tendency in the stomach, and probably in the intestinal canal, to generate a considerable quantity of acid. A greater source of irritation can scarcely be imagined when the state of the lining membrane of the large intestine is taken into consideration. The chalk, or the carbonic acid of the chalk, will unite with and neutralize this acid, and render it harmless. Theoretic chemistry would lead to the substitution of magnesia for the chalk, for the carbonic acid being withdrawn, it might be feared that the caustic lime would be injurious; but experience has proved that magnesia is not so efficacious in cattle: that, in fact, it seems to be almost inert, while chalk has usually answered the purpose intended, and no inconvenience has resulted from it.*

Some practitioners strangely mingle vegetable and mineral tonics together, forgetful of the decomposition which frequently, or almost constantly ensues, and the impairment or total loss of medicinal power. Vegetable astringents agree best with the constitution of cattle, and they will not often deceive.

The nature of the disease however being considered, will the practitioner confine himself to the astringents? He has now to struggle with the consequences of inflammation—the weakness and want of tone which inflammation has produced, not only in the part itself but in the whole

* The author of the "Survey of Dumfries" recommends "an infusion of water trefoil, or the juice of the sloe." Mr. Daniell speaks of "a pint of dried box-leaves, rubbed small, and four ounces of madder, in a quart of milk." In Nairn, some farmers give raw potatoes, mashed! and others give undried oats and barley, made into a kind of mash, with a handful of salt, and a portion of potatoes. Mr. Parkinson, in his "Treatise on Live Stock," (vol. i. p. 246,) says, "I had a cow reduced so low by the flux in cattle called the *skit*, or rottenness, as scarcely to afford any milk, and I had had an eminent cow-doctor to her, who gave her up, and persuaded me that she must die, and advised me to send her to Smithfield, where she would sell for forty or fifty shillings, that being more than she would fetch when dead; and this doctor was recommended to me as one being particularly famous for curing this disorder; but I never knew a beast cured that was as bad as this cow. Knowing that almost all complaints arise from the stomach being in an improper state, I considered the case, and took the following method for cure:—I put about four ounces of chalk, beaten to a very fine powder, in one quart of the lees of red port, which I prefer, when they can be obtained: having mixed them well together, I gave it to the cow; and three doses, one every other day, effected the cure; for she came to her milk, calved, milked well, and afterwards made a good fat cow. I have since given it to two other cows, and it has had the desired effect." There are worse prescriptions than this, yet a much better astringent might have been administered than the port wine lees, with the quantity of ardent spirit which they contain: besides, if port wine is to be given at all, it should be in its pure state, and not the accumulation of all the tartaric acid and extractive matter which it contains deposited in the lees.

Mr. Knowles improves upon Mr. Parkinson. After recommending a strange mixture of tormentil root, and bole armenian, and grains of paradise, and turmeric, and madder, and these to be given in oak-bark tea, for the cure of dysentery, he says, that "red wine would be much better, or a pint of common brandy and a pint of water." This for inflammation of the bowels—and shown to be of the most intense character by the mucus being discharged so abundantly, that, in his elegant language, the beast is "parting with his puddings!"

system. He will also take into consideration the natural temperament and constitution of horned cattle. Some physiologists speak rather unintelligibly of the prevalence of the lymphatic system in certain persons and animals; but the fact is that cattle will not bear disease, nor the treatment of disease like some other animals, and particularly as the horse will. Diseases speedily run their course in cattle, and the patients often sink under the prompt and vigorous and scientific treatment of the malady. An ox may bear one copious bleeding well; but he cannot be bled again and again as the horse may. He will derive the usual advantage from purgation to a certain extent, but care must be taken lest it degenerate into the disease which is now under consideration. The practitioner will therefore mingle stomachics, and probably tonics, with his astringents in this case. Here also he will find the best in the vegetable kingdom. Not only custom but experience of its beneficial effect has made ginger a necessary ingredient in almost every medicine, unless the animal evidently labours under fever. Gentian is an admirable tonic and stomachic; and if to these are added calumba and cascarilla, the veterinary surgeon has sufficient choice. The proportions of the different medicines will necessarily vary with the age and strength of the animal, and the character, duration, and ravages of the disease.

Vegetable astringents and tonics having been fairly tried, and either not producing the desired effect, or beginning to lose their power, the mineral ones may be resorted to. The preference should undoubtedly be given to alum, and that in the common and very convenient form of alum whey. (See List of Medicines.) To this the usual quantity of ginger may be added without producing decomposition; and, if it should be deemed advisable, the opium may be continued. Should this not succeed, or not to the full extent that the practitioner wishes, blue vitriol (sulphate of copper) may be substituted; and to this the opium will be a necessary auxiliary. The dose should be about one drachm of the former and half a drachm of the latter. There is no other mineral astringent or tonic that can be depended on or safely given.

Clysters should not be neglected in this stage of the disease. With the assistance of the injection pump they promise to be as efficacious as any medicines that can be administered by the mouth, for they may be brought into immediate contact with the inflamed or ulcerated surface. Gruel may be made with a decoction of poppy-heads, as already recommended. To this may succeed an infusion of catechu, decoction of oak-bark, and with or without opium; and possibly a weak solution of alum or blue vitriol. The practitioner will here, however, proceed with considerable caution.

The malady being apparently subdued, there will be need for much caution in the after-treatment of the animal. He must not soon return altogether to green meat, and more especially not to luxuriant pasture. J. E., in the Survey of Sussex, speaking of the prevention of the first attack of diarrhœa and dysentery in working oxen, gives some excellent advice, which is applicable to all cattle, in order to guard against a recurrence of the disease. "The best way to prevent this (diarrhœa) is to continue to give a small quantity of hay for some time after turning to grass, and not to keep them too many hours at a time from water. When I see it coming on I keep the ox as much as possible on hay and bran, and let him have water often in small quantities."

For a long period after a severe attack of this complaint the animal will be subject to occasional diarrhœa, and will require careful management. The best thing to be done is to get him, as quickly as the state of his

constitution will admit, into fair condition and sell him ; but there will be some difficulty in accomplishing this, for abundance even of the most wholesome food will often be more than his debilitated powers of digestion can manage, and hoove, or diarrhoea, or dysentery will ensue. At the best, he will rarely be got beyond fair condition, and with that the farmer must be content. While the experience of the writer of this treatise furnishes him with various instances of permanent recovery from dysentery, it supplies him with but few cases in which the patient has " afterwards grazed and fatted as well as any other beast."

However perfect may seem to be the cure, the animal that has once been a decided *shorter* should never be bred from. There is a taint about him which will almost certainly be communicated to his stock. Dysentery is not only the pest of certain districts, and especially of cold and wet ones, but of certain breeds. The beautiful Dishly breed of long-horned cattle was swept away by it, when the master-mind of Bakewell no longer regulated the admirable, but (to the inexperienced agriculturist) dangerous system of breeding from near affinities ; and there is reason to believe that many of the yet more valuable short-horned stock have been destroyed by it. The breeding too far, and too incautiously in and in, will produce a weakness of constitution that predisposes to dysentery ; but, without insisting on this, the experience of many a farmer and many a dairyman will convince him, that the sooner he gets rid of a beast that has been a *scanterer* the better it will be for his stock.

One point more should, perhaps, be adverted to before this subject is dismissed—the supposed contagiousness of dysentery. There is a great deal of contradictory evidence with regard to the contagiousness of this complaint in the human being, and it would probably be deemed presumption in a veterinary surgeon to give an opinion on the subject ; but of his own patients he may speak, and he would say that there is not the slightest reason for believing that the dysentery of cattle is contagious.

As the large intestines are the principal, and, in most cases, the only seat of that inflammation which is characterised by the term *dysentery*, other intestines are occasionally subject to maladies either peculiar to them, or in which the neighbouring viscera participate to a greater or less extent.

INFLAMMATION OF THE DUODENUM.

Examination after death has occasionally discovered an inflammatory affection almost confined to the duodenum, or first intestine. This occurred to the author in two varieties of jaundice. In the one there appeared to have been an undue secretion of bile ; and this being received into the duodenum in its undiluted state, the mucous membrane of the whole of that viscus was inflamed. There were also spots of effused blood, and a small ulcer that seemed to have penetrated the mucous coat alone. In the other case there was considerable inflammation of the thickened substance that surrounds the orifice through which the bile enters this intestine, and which was probably produced by the continued presence and irritation of a gall-stone that had been here arrested in its progress. There were numerous red lines radiating in every direction. In both cases there was slight inflammation of the upper part of the jejunum.

In neither of these instances were there any peculiar or characteristic symptoms that would at once direct the attention of the practitioner to the duodenum as the chief or the only seat of disease ; but in both there was a yellow skin—evident pain—fever and purging.

A history of this disease must be left to future observers.

COLIC.

Of this disease there are two varieties. The one is **FLATULENT COLIC**, arising from the distension of certain portions of the intestines, occasioned by the food contained in them undergoing a process of fermentation. The pain which the animal evidently suffers, his moanings, his striking at his belly with his hind feet, a swelling on the right side of the belly, the occasional discharge of gas from the mouth and anus, constant restlessness, continual getting up and lying down again immediately, and all this accompanied by fever, would induce the suspicion that the animal was labouring under flatulent colic.

There are various reasons, however, why cattle should seldom be subject to this complaint. By the maceration which the food undergoes in the paunch, and the second mastication to which it is subjected in rumination, it is prepared for speedy and perfect digestion; and little of the mechanism that has been admired in the horse for the detention of the food is to be found in cattle. There is neither time nor disposition in the substances contained in the intestinal canal for this process of fermentation to be set up; and if there were, there are no labyrinthian irregularities to detain the gas, but it would be readily pressed on by the common peristaltic motion of the bowels, and expelled. Spasmodic colic has sometimes been mistaken for that which has been occasioned by the distension of the bowels; or, more frequently, inflammation of the outer coat of the intestines (the *red colic* of the horse) has been confounded with *flatulent colic*.

This species of colic will generally be relieved by the administration of almost any aromatic drink; but the chloride of lime, as in hoove, is most to be depended upon. Two drachms of the chloride dissolved in a quart of warm water, to which an ounce of the tincture of ginger, (or two drachms of the powdered ginger,) and twenty drops of essence of peppermint have been added, will form one of the most effectual colic drinks that can be administered. The chlorine unites with the extricated hydrogen gas, and causes it, or the greater part of it, to disappear; while the aromatic stimulates the intestine to contract upon and force forward and expel any small portion that may remain.

The beast should be walked about: exercise alone will sometimes cause the gas to be expelled; but the owner must not adopt the dangerous expedient of driving or worrying the beast with dogs, otherwise he may produce strangulation, or *netting*, or rupture of the intestines.

Should the first dose, and gentle exercise for a quarter of an hour, not produce relief, a purgative drink should be given, and that of an aloetic nature as more likely to operate speedily. The mode of preparing this drink will be found in a note.* Clysters of warm water, or thin gruel, should not be neglected, and with each clyster two ounces of the aloetic tincture should be administered. Friction on the belly and flanks is occasionally useful, and, in obstinate cases, it will be advisable to stimulate the whole of the belly with spirit of turpentine well rubbed in. In very bad cases, but not until other remedies have been applied, it will be useful to bleed. Warm mashes, warm gruel, and good old hay, should constitute the food of the beast for some time afterwards.

* Take of Barbadoes aloes four ounces, pimento powdered two ounces, and gum arabic two ounces; pour on them a quart of boiling water; stir the mixture well, and often; when it is cold add half a pint of spirit of wine, and bottle the whole for use: shake the bottle well before the requisite quantity is poured out.

A more prevalent species of colic, yet not so frequent in cattle as in the horse, is the SPASMODIC. It is spasm, or contraction of a portion or portions of the small intestines, and accompanied by more excruciating pain than the former. The animal is exceedingly uneasy, lowing, pawing, striking at his belly with his hind legs or his horns, continually lying down and getting up, becoming very irritable, and sometimes being dangerous to handle. It is distinguished from flatulent colic by the smaller quantity of gas that is expelled, the comparative absence of tension or enlargement of the belly, the more evident spasms relaxing for a little while and then returning with increased violence, and the freedom with which the animal moves during the remissions.

The feeding on acrid plants, or even on healthy food too great in quantity or too nutritive, the commencement of feeding on grains, exposure to cold after work, the drinking of too cold water, and especially after exercise, or of water impregnated with metallic salts, are occasional causes. More dangerous ones are the long continuance of purging and also the long continuance of costiveness. The treatment will be the same, except that as this proceeds from irritation in the intestinal canal generally, or in particular portions of it, which is apt to run on to inflammation, bleeding will be earlier resorted to; and the practitioner will not suffer the first symptom of inflammation to appear without adopting this best method of subduing it. After every case of colic, whether flatulent or spasmodic, the animal will require some attention and nursing, for in both of them the intestines are considerably weakened and predisposed to a repetition of the attack, and there are few maladies, the habit of the recurrence of which is so soon formed.

STRANGULATION OF THE INTESTINES.

Spasmodic colic, if neglected, or bidding defiance to medical treatment, occasionally leads to such an entanglement of different parts of the bowels with each other that they become tied into a kind of knot, and the passage of food along them is obstructed. This is no unfrequent consequence of colic in the horse, and when the small intestines of cattle are observed, hanging loose, as it were, at the end of the mesentery, (see Fig. 2. p. 451,) it is not to be wondered at, if, in the disturbed, increased, hurried, and sometimes inverted peristaltic motion which takes place in consequence of colic, one portion of the intestine should be entangled among the rest, and the fatal knot should be tied. Occasionally a small piece of fatty matter disengages itself from the mesentery and hangs floating in the belly, and then, either in the changes of situation which the bowels undergo in natural exercise, or more particularly in the commotion of colic, it entwines itself round a portion of the intestine and obstructs the passage. These twists, and loops, and knots are sometimes strangely intricate. When the dead animal lies before the practitioner it is almost impossible to unravel them. This is the true *net* or *knot* so dreaded in some parts of the country. It is the result of those colicky pains which have been mistaken for strangulation, and which have been increased and hurried on to the production of this involved state by the absurd and brutal measures that have been adopted. Strangulation having once taken place, there is and can be no remedy. All that can be done is to attack every case of colic in good earnest, as soon as it is perceived; for no one can tell how soon the displacement, twist, knot, or whatever it be, will occur in consequence of the perverted action of the intestines, or the violent struggles of the animal, caused by the torture which he endures.

THE CORDS OR GUT-TIE.

This is another singular and fatal species of intestinal strangulation that has lately been brought under notice by Mr. Corbet, of Simonborn.* It is not of unfrequent occurrence in some districts, and especially in wet and marshy situations: it is peculiar to the ox, and is rarely observed in him after the second or third year. The beast shows disinclination to food—rumination is suspended, or performed in a listless, interrupted manner—the animal appears to be griped—he strikes at his belly with his hind legs—he lies down, and as he gets up again bows his back in an extraordinary way, and then, all at once, stretching out every limb, he gives the spinal column a somewhat concave form. Small quantities of fæces are voided, mingled with mucus, and sometimes with blood; and if the animal is examined, by introducing the hand into the rectum, he evidently suffers extreme pain.

By degrees the ailment is referrible to one side more than the other, and generally to the left side. The hind leg on that side is frequently advanced and then retracted, and, in some cases, becomes partially paralysed.

These symptoms are more and more alarming—if the ox can be induced to eat, the griping pains are immediately increased—the belly swells—the countenance becomes anxious—the ears, the horns, the nose, and the thighs become cold—the pulse is small and accelerated, and scarcely to be felt—the breathing is laborious and heard at a distance—the mouth and nostrils are pale. The disease continues during six, seven, or eight days; it yields to no medicine—it is aggravated by most of the measures adopted—it is especially so if the beast is moved about—and at length death terminates the period of suffering.

On examination, strangulation of some part of the intestine is found, and generally of the small intestine. It is tied by a distinct and evident cord—in some cases it is the spermatic cord, which, after castration, unskilfully performed, or, now and then, by mere accident, has been retracted into the belly, and has become enlarged, and has had tumours forming on it, and particularly at its extremity. Oftener it is an adventitious or unnaturally formed membrane which becomes entangled round the intestine and assumes the appearance of a cord.

The mode of operation, in castrating bullocks, is often very absurd. Some practitioners pride themselves on performing it with scarcely the loss of any blood. They open the scrotum, and lay bare the spermatic cord, and then, by mere dint of pulling and twisting, they tear it out. There is, certainly, no bleeding, and the portion that remains immediately retracts into the belly; but the consequence of all this violence is that inflammation ensues—tumours, false membranes, are formed, and the foundation is laid for this complaint. Others draw the cord out as far as they can without tearing it, and then cut it off close to the pelvis. There is no external bleeding in this case; but there is bleeding within the cavity of the belly, and a source of irritation is set up by the presence of this blood, and various abdominal diseases ensue, and, among the rest, the *cerds* or *gut-tie*.

Mr. Dick, the talented professor of veterinary medicine at Edinburgh, to whom his own profession, and agriculturists in general, are deeply indebted, as a teacher of cattle medicine, gives a similar account of the cause of this disease. He says, "This seems to be the effect of cas-

* An account of this disease was published in the Repertory of Arts and Sciences, 1795, by Mr. Harris, a well-informed farmer in Herefordshire. It is said to have been very common in that country.

trating the ox, by drawing out the cord or spermatic artery. The vessel, when torn asunder, recedes into the scrotum and up into the abdomen, and there producing inflammation, the formation of a new membrane is the consequence.*

It is not, however, to be uniformly traced to this cause alone. It seems, especially, to prevail in low and damp situations—it has followed the use of half mouldy and unwholesome fodder—it has seemed to be connected with hard work, and that on an irregular or steep surface; and some have imagined that it is most prevalent where the floor of the ox stables is too much inclined, on account of the great pressure on this part of the abdomen, and especially in the act of rising. It can be readily believed that any source of irritation, whether of the spermatic cord, or of the intestines lying in the neighbourhood of it, or of the intestinal canal generally—in fact, that any, or all of the sources of common colic may be the predisposing, or immediate causes of this species of strangulation. If any circumstance, however, were to be selected as that to which the disease might be oftenest traced, it would be this unskilful mode of castration.†

Although it has been stated that no medicine seems to be of avail, the patient should not be abandoned. There is an operation, apparently difficult and dangerous, but really simple, easy to be performed, and generally effectual.

This operation is described, but somewhat unsatisfactorily, both by Mr. Harris and Mr. Corbet. The former had performed it on cattle from three months to nine years old. The following is the account of Mr. Corbet:—"The operation is begun by making an opening into the inside of the ox, beginning a little before the ileum. The arm is introduced, and, in general, the cord or ligament is easily felt, commencing a little behind the kidneys at the origin of the spermatic vessels, and attached to some part of the pelvis, and which appears to strangulate a portion of intestine. In some cases, I have found two ligaments, varying in size from a small quill to three times that magnitude. If operated upon early, the animal generally recovers without the aid of medicine.—I have known an animal remain five days, and I have then operated upon him, and the case has turned out successful."‡

It will be evident that this operation should be performed, the side line being used, and the beast remaining standing close to a wall, and fastened to it as well as circumstances will permit. The incision should be made on the left side, and taking, as the centre of it, the spot at which the flank

* Veterinarian, May, 1834, p. 266. Mr. Harris's account of this entanglement is drawn too much from imagination, and is deficient in correctness of anatomical detail. He says, "This stricture or gut-tie is occasioned by an erroneous method of castrating the calves, which the breeders practise throughout Herefordshire. They open the scrotum, take hold of the testicles with their teeth, and tear them out with violence, by which means all the vessels belonging to the part are ruptured. The vasa deferentia, entering by the holes of the transverse and oblique muscles, pass over the ureters at acute angles, and turning, by their great length and elastic force the peritoneum is ruptured. The vas deferens is severed from the testicles, and, springing back, forms a kind of bur. The part of the gut that is tied by it is the jejunum, at its turning from the right side to the left, and the entanglement is generally effected by some sudden motion of the beast." Rep. of Arts, 1795.

† A disease of this kind is very prevalent in Switzerland, and particularly in the canton of Bern. M. Anker, professor at the Veterinary School at Bern, has published a very satisfactory account of the symptoms and treatment of it, as furnished by his brother, a veterinary practitioner at Ins. (See *Practische Abhandlung des Veberwufes*, &c.) He attributes this entanglement to the spermatic cord, but he says little of the mode of castration, and dwells mostly on situation, and food, and stabling, and work among the steep mountains of Switzerland.

‡ Veterinarian, May, 1834, p. 265.

is generally punctured in cases of hoove, and where a small portion of the jejunum, and that which is the most likely to be entangled is protruded over the rumen, and floats by itself at the extremity of the mesentery. It should be a vertical incision, or a little oblique in a direction from behind forwards. A small opening should first be made, through the integument and muscle, avoiding, if possible, the peritoneum. Into this the first and second fingers of the left hand should be introduced, and thus, by means of a probe-pointed bistoury, guarded and guided by these fingers, the wound may be enlarged so as to permit the introduction of the hand of the operator. There will probably be a considerable gush of blood when the external oblique is first divided, but that will speedily cease by the retraction of the artery.

The peritoneum should next be divided, if it has not been so already, and the hand of the surgeon, the arm having been bared and well oiled, should be introduced into the wound; the epiploon or cawl gently torn; and the hand passed among the intestines in a direction upwards and backwards, or as Mr. Corbet describes it "a little behind the kidneys." The operator will soon feel the strangulated part, and the cord by which it is suspended or tied, and usually "attached to some part of the pelvis." Having satisfied himself with regard to the situation of *the cord*, he will withdraw his hand, and, taking another shorter and more curved and probe-pointed bistoury,* and having it in the hollow of his hand, and guarding the cutting edge with his finger and thumb, he will introduce it into the abdomen, find out the cord again, and cautiously divide it. The hand will once more be removed, in order to get rid of the bistoury, and then re-introduced to ascertain whether the whole of the strangulated part has been liberated, which is easily effected by tracing all the neighbouring circumvolutions and passing them through the hand.

The operator being satisfied as to the state of the bowels, brings the edges of the wound together, and confines them by a sufficient number of stitches, including the peritoneum, muscle, and integument, in the same stitch. A pledget of tow is placed over the wound, and a broad bandage passed tightly several times round the belly, which must not be removed during the first six or eight days.

The decided majority of cattle thus operated upon are saved, and the wound is usually healed in somewhat less than a month. It may, however, be supposed that after the extensive opening into the abdominal cavity, and this laceration of the cawl, and groping and cutting among the intestines, some alarming symptoms will occasionally supervene. The belly will swell, and sometimes to a considerable extent. Fomentations, and, if necessary, scarifications may be resorted to. There may be manifest symptoms of fever, as shiverings, heaving at the flanks, and cessation of rumination. Blood should then be abstracted, according to the state of the patient; half-pound doses of Epsom salts should be given morning and night, until the bowels are moderately opened, and the beast should have little besides mashes and gruel, and should be kept as quiet as possible.

INTROSUSCEPTION OF THE BOWELS.

This is another fatal consequence of colic. While certain portions of the ileum or jejunum generally, but occasionally of the larger bowels, are distended by gas, other parts are spasmodically contracted, and then, by the increased peristaltic motion which is going on, the collapsed part of

* Mr. Harris describes the knife as being of the form of a large fish-hook, with a cutting edge on the concave side.

the superior or anterior intestine slides, or is forced down, into the distended part behind; or, by that inverted action which takes place in the intestine commotion of colic, a contracted portion of the bowel slides or is forced into the distended part before, and thus one intestine is strangely contained within another, and that occasionally reaching to a considerable extent. The mesentery is usually torn in this unnatural procedure, for otherwise that too must be taken up or carried down into the distended intestine above or below.

It will be easily conceived that this will inflict great torture on the beast, and an examination after death will sufficiently prove the intensity of the suffering; for there will be much inflammation, and generally gangrene of the involved part, and sometimes of both portions of the intestine. The symptoms by which the practitioner may be induced to suspect, or may know that colic has run on to introsusception, are not yet determined. Increase of pain, attended by obstinate constipation, rapid prostration of strength, and comparatively little fever, may be obscure indications. It is evident that this case must be beyond the reach of medical skill. The most powerful purgatives, the crude mercury, the shot, the living trout of some practitioners,* must be useless; a knowledge of the anatomy of the stomachs, however, should have taught these men, that the shot, and the mercury, and the trout would necessarily have found their way into the rumen, where they could not possibly have produced any good effect.

Mr. Cartwright furnishes the only case on record of the occurrence of introsusception in cattle. He saw a bull-calf six days old, that appeared to be in pain. It was continually lifting its head towards its belly; it discharged some blood from the anus, and it would not suck. Being at some distance from home, he gave it two ounces of Glauber's salts, and two table-spoonfuls of common gin in a pint of the cow's milk. In the evening it was worse; it was almost continually down; it shifted its legs towards its belly; it continued to discharge blood in small quantities; and the pulse was quickened. He ordered it to be drenched with new milk.

On the following day, it was weaker; it could not stand; it breathed very quickly and laboriously; but the discharge of blood had ceased. The pulse could scarcely be felt, and no vein could be raised in order to abstract blood. Six ounces of Glauber's salts were given, but the calf died in the afternoon.

On examination after death, the rectum was found to be hard and distended; it presented both strangulation and introsusception, for one portion of intestine was contained within another, with its coats much thickened and black, and in a completely gangrenous state.†

The case-book of the writer of this treatise furnishes him with a more extraordinary and decisive case. It was an old and rather overworked ox. The beast had performed its task well three days before. That day was cold and wet, but the animal fed as usual on his return, and there was no indication of illness. On the following morning, however, there

* A pupil of Mr. Dick was consulted respecting an ox labouring under constipation of the bowels. The disease proved obstinate; it resisted every remedy adopted, and the case was abandoned as utterly hopeless. At this stage of the business the old-established leech of the district stepped in, and confidently engaged to set matters to rights. He commenced with no less active a remedy than a lively trout, transferred from the river to the stomach of the patient, with the conviction that his agent would thread his way through all the mazes of the intestines; and he ascribed the failure of so notable a dose to the previous mismanagement of the Edinburgh student.—*Quarterly Journal of Agriculture*.

† *Veterinarian*, Feb. 1829, p. 71.

were evident symptoms of colic; the ox was in great agony. Antispasmodics, stimulants, and purgatives were freely administered, and twelve pounds of blood were abstracted. The animal at length obtained some relief; he lay down; he occasionally looked at his right flank; he struck it with his horn; he moaned; but there was not so much expression of intense agony. The bowels were obstinately costive, although four pounds of Epsom salts had been given and a drachm of the farina of the croton nuts and numerous injections had been administered. At length purging came on, and was exceedingly violent; the beast then got up; it staggered listlessly along; it now and then looked at its side; it began at long intervals and half unconsciously to ruminate; and it drank some gruel. On the second day of the purging, the animal strained considerably, and a black substance was observed to protrude and hang from the anus. It was evidently a portion of intestine. There had been intussusception, and this was the involved part, which had become gangrenous, and had separated and passed away.

It was some time before the ox fully recovered his usual health and appetite, but he was sent to the market, six months afterwards, in fair condition.

INVERSION OF THE RECTUM.

It has occasionally happened in the straining of diarrhoea, and in the still more violent efforts with which the faeces are expelled in dysentery, that a portion of the rectum is protruded from the anus; the sphincter muscle of the anus then contracts violently upon it, and no effort of the animal can draw it back, nor will it readily yield to any external force employed. The blood is necessarily congested in the protruded intestine, from the situation of the part; the gut is intensely red, and it gradually becomes livid, black, gangrenous. The animal all the while is making frequent and violent efforts, during which small quantities of excrement, or mucus, or blood, or gas, are extricated; the protrusion of the gut increases; irritative fever ensues; and death speedily follows.

Internally, in order to allay irritation, and in some measure lessen these efforts by which more of the intestine is expelled or its return prevented, a pint of castor oil with two drachms of opium should be administered; and a quantity of blood, varying with the size and condition of the animal, abstracted. The protruded part should be thoroughly cleaned, and diligently fomented, during the space of an hour with a decoction of poppy-heads, lukewarm. Gentle, but long-continued efforts should then be made to return the intestine, which will be accomplished much oftener than would be imagined if the operator will have patience enough. The gut having been returned, cold water should be applied around the anus, and for a considerable time, in order that the sphincter muscle may more powerfully close, and confine the intestine in its proper situation. It may, however, again protrude, but it should be immediately returned, and, care having been taken to allay the irritation of the bowels and of the system generally, the straining will gradually cease, and the intestine will no longer be forced out.

If the protrusion continues in despite of every effort, and the part begins to swell, and to become black, and foetid, and mortified, and the pulse is small, and the mouth hot, and the ears cold, and the muzzle dry, and the eyes red, and the appetite and rumination are suspended, and the animal is rapidly becoming weak, the practitioner must have recourse to a bold and dangerous operation, but which will succeed much oftener than it will fail. He must cut off the protruded intestine close to the anus. There will

probably be considerable hæmorrhage, but he must not be alarmed at that; it will be beneficial rather than injurious; it will prevent or abate inflammation, and it will cease long before the strength of the patient is exhausted. The little portion of intestine half protruded at the anus will gradually return; the sphincter muscle will contract; union of the divided portion of the intestine will take place, and the animal will perfectly recover.

CONSTIPATION.

The immediate cause of many of these affections of the bowels is constipation. The beast is *sapped* or *bound*. This constipation is often exceedingly difficult to remove, not, perhaps, from any want of power in the intestinal canal to be acted upon by purgative medicines, but from the impossibility of getting any considerable proportion of the purgative into contact with the internal surface of the bowels. It has already been observed that in a state of health much of the fluid swallowed by cattle enters into the rumen, and is detained there for the purpose of macerating the food and preparing it for rumination; and we have proof, and that sufficiently annoying, that in some circumstances of disease, all the fluid swallowed goes into the rumen, and is lost so far as the purpose for which it was administered is concerned.

Mr. Simonds relates a case in which a heifer had been feverish, and had refused all food during five days; and four pounds of Epsom salts, and the same quantity of treacle, and three-fourths of a pint of castor oil, and numerous injections had been administered before any purgative effect could be produced.* It has not unfrequently happened that six, seven, and eight days have passed, and the bowels have remained in a constipated state.

This must of necessity aggravate the symptoms of many diseases, and lay the foundation for others, and, among the rest, for those to the consideration of which the few last pages have been devoted.

The method of proceeding in such cases is sufficiently evident. When the state of the animal indicates the administration of the Epsom salts, they should be accompanied by the usual quantity of some aromatic, (half an ounce of ginger,) and be given in as gentle a way as possible. There can scarcely be a better way than suffering it to run from a long narrow-necked bottle introduced into the mouth. Should not this operate at the expected time, a second dose should be given, and, probably, with the same quantity of the aromatic; certainly so if little fever is present. If this, however, should have no effect, it is very probable that from some sympathetic influence extending over the whole of the digestive organs, the roof of the rumen is open, or the pillars of which that roof is composed are in a relaxed state, and yield even to the pressure of a fluid gently poured down the gullet. Then the next dose (for the purgative must be continued until it does operate, and the nature of that purgative, and the knowledge of the manner in which the quantity already given has been disposed of, remove all fear of inflammation or superpurgation being produced) must have an increased proportion of aromatic, increased in defiance of existing fever, and increased to the full extent to which the practitioner dares to go. Probably, a cordial-drink (an ounce of ginger and the same quantity of carraway powder) would be given with advantage; for the rumen might be roused to its natural action by the stimulus, and the pillars of its roof might be closed, and the next dose might run on through the manyplus into the abomasum. The rumen may possibly be roused

* Veterinarian, Sept. 1829, p. 357.

to act in another way; a portion of the fluid that it contains may be injected into the œsophagean canal by a process somewhat resembling that by which the pellet of food is thrown there for remastication; and the muscles of that canal, and of the base of the gullet, not being able to grasp it because it is a fluid, it will necessarily pass on through the manyplus into the fourth stomach and intestines. It has been stated that there are other ways in which the rumen may be excited to act, viz. when, although comparatively rarely, the contents of that stomach, instead of being returned, pellet after pellet, are thrown in great quantities into the œsophagean canal, and conveyed to the mouth by a process similar to that of vomiting; and, more frequently, when, although they are still ejected from the stomach in considerable quantities, the muscles of the œsophagean canal, and of the gullet, do not lend their aid to effect their expulsion through the mouth; and, consequently, a passage being denied them through the gullet, they are driven through the base of the manyplus, and are recognised in the dung by their fibrous character.

It is by some mechanism of one of these kinds that purging is at length established after obstinate cases of constipation; or, when the animal dies and almost all the purgative medicine that has been given is found in the rumen, it is because that stomach has not been sufficiently stimulated. There is something in the structure of cattle which renders certain medical rules and principles altogether inapplicable, and which, in defiance of all fever, occasionally compels us to mingle strange doses of aromatics and stimulants with the very means by which we are endeavouring to subdue inflammation. This is a very important consideration in the treatment of disease, and the profession owes much to Mr. Friend for having first directed their attention to it; although it should be stated, in justice to the lecturer on veterinary medicine in the University of London, that it was a doctrine which he had long inculcated on his pupils.

CALCULI.

It has been stated (pp. 434 and 435) that various concretions are found in the rumen of cattle. It is the natural situation for them, for there the food is longest detained, and there they have time to form, as in the colon and cæcum of the horse. A few, but much smaller calculi, are occasionally found in the reticulum; others, composed of thin and friable concentric layers, occupy, yet comparatively rarely, the large intestines of cattle; but they also are not of great size, for the food passes too rapidly over the smooth surface of these portions of the digestive canal. There are no symptoms by which their presence can be recognised, nor is there any evidence of their being the cause of disease, although it is not improbable that the presence and pressure of these bodies, and the irritation produced by them, may in some instances be the cause of colic, strangulation, and other serious affections.

WORMS.

These occasionally are found in the intestines of cattle, but in no great quantities; nor are there any authenticated accounts of their being the cause of irritation or disease. The food is so perfectly prepared for digestion, and that process is so rapidly accomplished, and the nutriment is so completely extracted, that there is little left for the support of worms; nor, if they are received into the intestines in the state of ova, or eggs, would they be likely to escape the processes of digestion which take place in cattle.

The *Amphistoma conicum*, a worm with a mouth, or the appearance o

one, at each end, and often found plentifully in the intestines of birds, frequently inhabits the rumen and reticulum of cattle. It is here of considerably larger size, and swells into a somewhat conical form.

The *Tænia denticulata*, the denticulated tape-worm, small in size, and the neck becoming fine, and sometimes almost threadlike, is found in the fourth stomach and in the small intestines.

The *Lumbricus teres*, the common intestinal round worm, and fully as large as in the horse, lives in the small intestines.

A small species of the *Strongylus* is a frequent companion of the last; and another small long worm, the *Tricocephalus affinis*, with its minute head attached to its lengthened and threadlike neck, has been discovered in the cæcum.

The presence of these worms is rarely taken into account by the practitioner, and few means are taken for their expulsion.

Mention has already been made of the hydatid (*Cœnurus cerebralis*) inhabiting the brain; and others (*Cysticerci tenuicolles*) found in the liver, the lungs, the spleen, and in the peritoneum and the pleura; the *Strongylus filaris*, occupying the bronchial tubes of cattle, and the *Distoma hepaticum*, the *fluke worm*, swimming in the biliary ducts.

DROPSY.

This is an accumulation of fluid in the cavity of the belly. The whole of that cavity is lined with, and every viscus which it contains is covered by, a polished, glistening membrane, so that the contents of the abdomen may glide over and move easily among each other, and the injurious effects of friction be as much as possible avoided. In a state of health there are certain vessels which continually secrete or pour out the fluid that is requisite for this purpose, and which are called *exhalent* vessels; and there are others that take this fluid up and carry it into the circulation when it has discharged its duty, or when it is secreted in undue quantities, and which are denominated *absorbent* vessels. Dropsy, then, is the consequence of the pouring out of an undue quantity of fluid, and faster than the absorbents can carry it away; or it is the pouring out of the natural quantity while the absorbents are paralysed, or do not do their duty in removing it; and in either way it accumulates in the abdomen. It is easy, therefore, to suppose, that when the lining membrane generally, or a portion of it, is inflamed, and a greater quantity of blood than usual is determined to that part, the secretion from the exhalent vessels will be increased; and in consequence of this there will be accumulation of fluid in the bag of the heart, when that organ, or its investing membrane, is inflamed; dropsy in the chest will be the consequence of pleurisy, and dropsy of the abdomen that of inflammation of the peritoneal membrane generally, or of any part of it. Chronic inflammation of the liver or spleen, or of any particular portion of the intestinal canal, will have the same termination from increased action of the exhalents; a similar effect will occasionally be produced by the sudden stopping of any long-continued evacuation, or acute or chronic eruption; and on the other hand, feeding in low, marshy situations; the privation of wholesome aliment, and every cause of general debility, will produce an accumulation of fluid from loss of power in the absorbents.*

* The luminous description of the cause of dropsy given by Mr. Knowlson is here subjoined. When a person who has "been fifty-seven years in full business" can write so nonsensically, the knowledge of cattle medicine must be at a low ebb.

"It is a stoppage in the gall-pipes which lead from the gall to the bladder, and enter the neck of the bladder, from whence there is a passage between two skins to the bottom.

Of acute dropsy the practitioner has occasional examples. A beast, apparently well on the preceding day, suddenly exhibits manifest symptoms of inflammation of the bowels. The disease proceeds in defiance of all medical treatment, and in two or three days the patient is lost. On examination after death the traces of inflammation of the peritoneum are sufficiently evident; there is deposition of flocculent matter; there are adhesions; but, most important of all, the belly is filled with clear, or turbid, or bloody fluid; and the death of the animal was as much occasioned by the irritation produced by the pressure of this fluid, and the labour of breathing which it occasioned, as by the previous or still-existing inflammation.

Of chronic dropsy, or a slower filling of the belly, he has more frequent proof. The beast increases slowly in size; it is an enlargement, not of the left side as in hoove, or of the right as in flatulent colic, but of the belly generally, and sometimes almost as slow as in the increase of condition. It evidently is not that, for the limbs are wasting; or if they occasionally increase in size, it is a puffy œdematous enlargement, and not the honest accumulation of flesh and fat. The animal at the same time is dull; disinclined to move; the skin is dry; the coat is rough; the thirst is excessive; there is alternate constipation and diarrhœa; the membranes of the mouth and nose are pale, and the conjunctiva is of a faint yellow. By degrees the belly drops, and leaves a considerable hollow at the flanks, and by tapping on the sides the evident fluctuation of water can be perceived. The pressure of the fluid on the diaphragm lessens the cavity of the chest, and does not leave sufficient room for the lungs to expand—labour of breathing ensues—it increases; the animal is not able to stand long, and when he lies down the respiration is so difficult, and the feeling of suffocation is so strong, that he scrambles up again as quickly as his remaining strength will permit, and at length dies either of absolute suffocation, or mere debility.

The chance of success in the treatment of such a disease must be little. The first object is to relieve the sad oppression under which the animal labours, and that must be effected by puncturing the belly, and suffering the fluid to escape. There is neither art nor danger about the operation. The beast should be tied up close, and a side line put on;* a puncture should be made with a lancet or trocar under the belly, six or eight inches from the udder, and half as much from the middle line of the belly, and on the right side,—the milk vein and the artery which accompanies it being carefully avoided. The opening should not be larger than would admit the little finger; and if it is made with a trocar, the canula may be left in the wound until the fluid has quite run out.

The wound being thus small there is no need for the often fruitless care to close it again with adhesive plaster when the purpose for which it was made has been effected. There will not only be no danger, but manifest advantage, in a small drain of this kind being left open; for the fluid which before it enters the bladder. When the pipes are too much forced, or stopped by glueish matter, the urine cannot find a free passage, but oozes out, and in time fills the beast's body."—*Knowlson's Complete Cow-Leech or Cattle Doctor*, p. 65.

* Many veterinary surgeons prefer to cast the beast; but rupture of the diaphragm has followed the violent struggle which generally occurs in casting, and especially when there was previously so much pressure on that part by the accumulated fluid. The distress of the dropsical animal is frequently extreme after it is thrown, not only on account of the respiration being hurried, but the additional pressure on the lungs when the patient is lying down. There is not the supposed danger of wounding the intestines while the animal is standing, for they are floating loose in the fluid, and recede before the instrument; while there is this advantage in the standing position, that the fluid drains away to almost the last drop.

may continue to be secreted will dribble away during two or three days, and thus permit the peritoneal membrane and the abdominal viscera (freed from the oppression around them) to recover their healthy tone: whereas if the wound is immediately closed, the fluid of dropsy will begin at once to accumulate again, and there will be far less chance of effecting permanent benefit. The quantity of fluid that is sometimes got rid of by means of this operation is very great. Mr. Wright, of Burnham Overy, told the author that he once took away twenty-seven gallons at one time, and ten gallons more from the same cow a little while afterwards. It is by no means uncommon for twenty gallons to escape, and there are records of thirty-two gallons having been drawn at once. There is little chance of permanent cure in cases like these, for there must have been great disease and disorganization in order to produce effusion to this extent, and that disease must have been of long standing, and therefore not easy to be removed. In addition to this, all the viscera of the abdomen must have been debilitated, and have lost their natural tone and function by the continued pressure and maceration. Still a cure is worth attempting, for the practitioner has done little by the mere temporary relief which the operation has afforded.

In order to prevent the refilling of the belly two objects must be accomplished, namely, the determination of this fluid to some other part where it shall be regularly discharged, and the restoration of the general health of the animal, and, with this, the proper balance between the exhalent and absorbent vessels. It is therefore usual to give a dose of physic immediately after the operation, that the fluid which might otherwise begin again to fill in the belly may be carried off by the discharge thus established; the physic is repeated as frequently as the strength of the animal will permit. This is a way of proceeding, however, not very favourable to the re-establishment of health and strength, and therefore greater reliance is placed on a course of diuretic medicine, with which tonics can be combined; purgative medicine being still occasionally given. Half an ounce of nitre, with a quarter of an ounce each of tartrate of iron, common liquid turpentine, gentian and ginger, may be given daily with great advantage. Bran and malt mashies will be useful at first, and when the beast goes again to grass, care should be taken that the pasture is good, but not too luxuriant or rank. Mr. Tait, of Portsoy, N. B., operated on a cow that was dropsical; eight gallons of fluid escaped. The cow seemed to be faint when she got up; and, in general, some weakness and disinclination to food will remain two or three days after the operation, attended at first by considerable heaving, and apparent distress, for it is a great change from the tumid and overloaded belly to the perfectly free and natural state of its contents, and which do not at once accommodate themselves to that change. He gave her a dose of physic consisting of Epsom salts with ginger, and commenced a course of nitre in doses of half an ounce. The animal became "quite well again." *

This was a favourable case, and the quantity of fluid evacuated was comparatively small; but the belly so frequently fills again after the lapse of two or three weeks, that it will be prudent to part with a cow that has been dropsical as soon as she can be got into tolerable condition. The exhibition of diuretic and tonic medicines will, perhaps, stave off the return of the disease until this can be accomplished; but the organs of digestion have been so debilitated, and these exhalent and absorbent vessels have been so habituated to an unnatural action, that a perfect and permanent restoration to health can seldom be expected. A second operation

* *Veterinarian*, Feb. 1833, p. 78.

may be attempted if the belly has filled again, but the chances of success are then most materially diminished.

There is scarcely a book on cattle medicine in which, if this disease is mentioned at all, there is not strict caution that the beast should not have too much water. This is altogether erroneous. The object to be accomplished is to restore the animal as nearly as possible to a state of health; and this can never be effected by curtailing the proportion of fluid that is necessary for the maceration and digestion of the food, and the supply of all the secretions. A state of unnatural thirst and fever would, on the contrary, be induced, which would weaken the animal, and dispose it for a recurrence of the disease.

HERNIA, OR RUPTURE.

A portion of the intestine occasionally protrudes through the walls of the abdomen. This may be the consequence of external violence, the beast having been gored by one of its companions. The external wound may probably be small, or, in some cases, the skin may not be broken at all, but the internal wall of the belly is injured, and partially or entirely ruptured. In consequence of this a tumour soon appears, varying in size according to the extent of the injury. It is a portion of the intestine that is protruding. The enlargement is tender when pressed upon, but it does not seem to interfere with the health of the animal, and a fortnight or three weeks elapse before any serious consequence is observed: at length the tumour begins to increase very rapidly; the animal expresses considerable pain on being moved, and is only comparatively easy when lying down, and even then it moans occasionally; the breathing is quickened; the countenance is anxious; the pulse is quick and small; rumination has stopped, and the usual evacuation of fæces is diminished. It is plainly a protrusion of the bowels, and now attended with some degree of strangulation, or pressure of the edges of the wound upon them and thus obstructing the passage of their contents. The tumour is generally soft and yielding, and, on pressure, a gurgling noise is heard within it. On inspection of the cut, p. 467, and observation of the loose manner in which the small intestines are attached to the edge of the mesentery, it will be easy to account for the occasional enormous size of the tumour, and the quantity of intestine which is protruded.

It is rarely possible, by any manipulation (*taxis*), to return the bowel; and if it could be returned, it would immediately escape again. It is therefore loss of time to endeavour thus to treat the case. It would be worse than loss of time, for considerable inflammation may be set up by a long-continued and rough handling of the part.

The beast must be thrown and held on his back, with the hind parts somewhat elevated. An incision must be made through the skin corresponding with the length of the tumour, especial care being taken that the protruded intestine, which will be found immediately underneath, is not wounded. Then, if there is any strangulation of the intestine, which in most cases there will be, the first and second fingers of the left hand must be introduced between the bowel and the edge of the wound; a crooked knife (a bistoury) must next be passed cautiously between the fingers, and the wound enlarged sufficiently to enable the protruded mass to be returned. The bowel having been thus replaced in its natural cavity, the edges of the wound through the walls of the belly must be brought together and retained with stitches, the skin, if necessary, being dissected back a little in order to get at the whole of the wound. Stitches must then be passed through the skin, the divided edges of which should be

brought together in the same manner. In a few cases it will be practicable, and always advisable when practicable, to include the skin and the muscular wall of the belly in the same stitch. A pledget of fine tow must be placed over the incision, and upon that another pledget smeared with simple ointment. This must be confined by a bandage five or six inches wider than the wound, and which must be passed twice or thrice round the body, firmly sewed, and, if possible, not removed for ten days. At the expiration of that period the edges will be found to have adhered along the greater part of the incision, the stitches may be withdrawn, and what remains unhealed may be treated as a common wound. Should much œdematous swelling appear on either side of the bandage, the parts should be well fomented with warm water, or, if requisite, lightly scarified. The beast should be kept on rather short allowance, the food consisting chiefly of mashes, with a little hay or green meat, and a dose or two of physic should be given during the progress of the cure.

If the horn should have broken the skin, as well as lacerated the muscular part beneath, and the intestine protrudes, it must be cleared from any dirt or extraneous matter about it, then carefully returned, and the wound closed and the bandage applied as already directed.

The author has not only seen a considerable portion of bowel protruding, but the bowel itself torn. Even then he has not despaired, for the healing power in these animals is such as the human surgeon would scarcely deem possible. The rent of the intestine may be closed by a stitch or two, with well-founded hope of the edges uniting, and the intestinal canal becoming perfect and whole.*

Calves are occasionally dropped with ruptures. They principally occur along the middle line of the belly, and not far from the navel. It is usually a protrusion of a portion of the omentum or caul; but in a few instances one or two small convolutions of the intestines have been involved. The principal danger is that the rumen, when unnaturally distended by food or gas, may press upon and injure the portion of caul or intestine immediately within the abdomen, and turning over the edge of the opening.

* Dr. Cheselden relates a very extraordinary case of this healing power, and does not forbid hope, although the intestines may have been injured to a very great extent. "An ox," he says, "was suffering under constipation of the bowels. Thomas Brayer, a doctor for cattle, opened the ox in the flank, and took out great part of his bowels; upon searching which he found there was a perfect stoppage in the guts, and the gut was, about the stoppage, putrified for three quarters of a yard; whereupon he cut off so much of the gut as was putrified, and took it quite away, and then drew the ends of the guts which remained sound, after what was cut off, together upon a hollow keck, which was about three or four inches long, and sewed the said ends of the guts together upon the said keck, leaving the keck within the guts, and then sewed up the hole cut in the hide upon the flank of the said ox. Within the space of one hour after this operation was performed, the ox dunged, and the piece of the keck which the said ends of the gut were sewn upon, came away from the ox with the dung, whereupon the ox recovered, and lived to do the owner service several years."

Mr. Thomson, of Beith, relates a similar case in the pig. He was castrating one, and he says, "having laid the animal on a table, and while I was in the act of cutting through the peritoneum one of the assistants lost his hold; the pig sprung up, and the scalpel was plunged deep into the belly. I proceeded to extract the testicles, but saw that some of the intestines were wounded, as fæces were escaping from the opening in the side. The greater part of the small intestines had to be drawn out through the opening before the injury could be discovered. The knife had entered deep among the convolutions of the ileum, and divided one of the guts almost through, and it had also made a considerable wound in the mesentery. A fine needle and thread were immediately procured; the gut and mesentery were nicely adjusted and sewn together, and returned into the belly; the side was secured by stitches, and the pig was liberated. I had not much hope of success in this case, but the healing power in the swine appears to be strong, for in two days afterwards little appeared to be the matter, and the animal soon completely recovered."—*Veterinarian*, March, 1834, p. 149.

Any serious operation with a view to the reduction of the rupture would scarcely be advisable, but it would be prudent to fatten and dispose of the animal as soon as convenient.

Bull calves are sometimes born with rupture in the groin. The opening through which the testicle afterwards descends into the bag is lax, and yields to slight pressure, and in the motions of the fœtus in the womb a small convolution of the intestine slips down. This sometimes continues of nearly its original size for several months: in some cases it is gradually retracted and disappears; in others it increases in volume with greater or less rapidity. A remedy is often to be found for this as soon as the testicles descend into the bag; and at which time, if the hernia will ever be serious, it begins to increase or to be strangulated—the beast should be castrated.

After the animal is thrown and properly confined, the protruded intestine should be gently and carefully pushed up through the ring or opening, the testicle being somewhat drawn out, in order to render this more practicable. Continued and gentle pressure applied on the sides of the tumour will more facilitate this than the application of the greatest force. The intestine having been returned, the finger of an assistant is placed at the opening, and the operator proceeds to cut into the scrotum as quickly as he can, and to denude the testicle, to apply the clams, (which will be hereafter described,) and to divide the cord. The clams will form a temporary and effectual support; and by the following day, when it is usual to remove the clams, a degree of inflammation and engorgement of the parts will have been set up, that will either obliterate the ring, or so far contract it, that it will be impossible for the gut afterwards to descend.

There is one circumstance to which the practitioner should most carefully attend. The protruded intestine always carries with it a portion of peritoneum—it is contained in a bag formed by the investing membrane of the bowels. The whole of this bag may not have been returned when the intestine is pushed up: the operator must ascertain this, and by no means open any part of the peritoneal covering that may remain.

Castration will usually remove this hernia and all its unpleasant or dangerous consequences, and the beast will be as valuable for grazing and for working as if nothing had occurred.

In a few cases, however, the hernia will be strangulated. So great a portion of intestine, or of fœcal matter in that intestine, will have descended, that the operator cannot return it through the abdominal ring. Even the somewhat desperate expedient of introducing the hand into the rectum, and endeavouring to find out the portion of intestine connected with that which has descended, and forcibly retract it, may fail: a different kind of operation must then be attempted, and which a skilful veterinarian alone can perform.

A species of rupture, very difficult to be treated, has occurred to cows in an advanced period of pregnancy. An excessive accumulation of fluid has taken place in the womb, or calf-bed, and the tendinous expansion of the muscles which support the lower part of the belly has given way. The farmer says, that “the rim of the cow’s belly is ruptured.” A portion of the womb escapes through the opening, and descends into the groin, or seems to occupy the udder. Mr. Allinson, of Idle, relates a case,* in which the head of a calf had been forced down into the groin. The calf was extracted with no great difficulty, but the bowels then descended through the rupture into the place that had been occupied by the fœtus, and the animal was irrecoverably lost.

There is one more species of rupture to which cattle are subject, and

* Veterinarian, October, 1831, p. 555.

the existence of which cannot always be ascertained during life, namely, that of the diaphragm, or midriff. In distension of the rumen there is always great pressure against the midriff. This is increased when severe colicky pains come on, and especially when improper means have been resorted to, such as strong stimulating drinks, or rude exercise, or when the animal, in a state of half-unconsciousness, has violently beaten himself about. The midriff has then given way, and a portion of the intestine, or of one of the stomachs, or of the omentum or caul, or of the liver, has been forced into the cavity of the chest. This may be suspected when, after the usual symptoms of hoove or colic, great difficulty of breathing suddenly comes on, and is evidently attended by excessive pain—when the animal is every moment looking at her side, and especially at the left side—when she shrinks, and bows herself up as if the muscles of the belly were violently cramped—and when she stiffens all over, and then suddenly falls and dies in convulsions.

Examination after death has sometimes displayed chronic rupture of this kind. The attack has been as sudden, but the colicky pains have not been so violent; they have intermitted—disappeared; but an habitual difficulty of breathing has been left behind—disinclination to rapid motion—fright when suddenly moved—anxiety of countenance—perhaps impairment of condition—and certainly impossibility of acquiring any considerable degree of condition. This has continued during several months, until the animal has been destroyed, or has died from some cause unconnected with these symptoms; and then an old rupture of the diaphragm has been discovered, the edges of which had been completely healed, and the second stomach, or the liver, had been firmly placed against the opening, and had occupied it, and in a slight degree projected into the thorax. No medical treatment or operation could be of the slightest service in this case.

CHAPTER XIV.

THE URINARY ORGANS AND THEIR DISEASES.

THE KIDNEYS.

THE blood contains much watery fluid, which, after it has answered certain purposes connected with digestion, or the various secretions, is separated and carried out of the frame. The kidneys are the main instruments by which this is effected; and they are often called into increased action in order to compensate for the deficiencies of other parts. When the usual discharge of perspiration from the skin is suspended, the kidney takes on increased activity; and when fluids are accumulating in the frame generally, or in particular parts, they escape by means of these organs. Also other substances, the accumulation or the continuance of which in the frame would be injurious, are got rid of by means of the kidneys. The essential principle of the urine (the *urea*) is one that would be noxious, or perhaps destructive.

The kidneys are two glandular substances attached on either side to the spine beneath the muscles of the loins. They are not, however, exactly opposite to each other, but the left kidney is pushed somewhat backward by the great development of the rumen. A very large artery runs to each. The quantity of blood which that vessel carries shows the importance of the kidneys, and well accounts for the inflammation and other diseases to which they are occasionally subject. These arteries divide into innumerable little branches, coiled upon and communicating with each other in a singular manner; and the blood, traversing all these convolutions, has its

watery and noxious ingredients separated in the form of urine, which is carried on to the bladder, while the portion that remains is returned to the circulation by means of the veins, which bear a proportionate size to that of the arteries.

As the process of digestion is so much more perfectly performed in cattle than in the horse, and all the nutritive, and some perhaps of the noxious matter which the food contains, is taken up and received into the circulation, the kidneys have more to do in order to complete this process of separation; they are therefore of considerably greater size in cattle than in the horse; they are more complicated in their appearance; they present an assemblage of different lobes or lobules, separated by deep scissures; there are additional provisions made for their security—they are deeply embedded in a covering of fat, and there is another accumulation of fat surrounding and defending the different vessels that are received or given off. The bulk of the rumen, and the danger of occasional pressure from it, may in some degree account for these provisions of safety; but a more satisfactory reason is to be found in the greater extent and importance of the function which these organs in cattle have to discharge.

RED-WATER.

Although the destructive stimuli, which, under the form of unwholesome food, or diuretic medicine, are so often applied to the kidneys of the horse, are rarely used in the general management of cattle, or in the treatment of their diseases, these organs are, from the natural extent and importance of their function, much more liable to inflammation than the kidneys of the horse. The disease, termed *red-water* from the colour of the urine, is one of the most frequent and untractable maladies of cattle. It may be conveniently divided into *acute* and *chronic*; in fact, two diseases essentially different in their symptoms, demanding different treatment, and referrible to different organs, have been confounded under this name.

A cow, in somewhat too high condition, and in whom the prudent precautions of bleeding or physicking had been omitted, frequently, a week or two before the time of calving, suddenly exhibits symptoms of fever; she heaves at the flank; she ceases to ruminate, and evidently suffers much pain; her back is bowed; she is straining in order to evacuate her urine, and that is small in quantity, expelled with force, highly tinged with blood, and sometimes consisting of almost pure blood.*

At other times, a few days after calving, when she had not cleansed well, or was in too good condition, and had not had that dose of purgative medicine which should always follow parturition, she suddenly manifests the same symptoms of illness, speedily succeeded by a similar discharge of bloody urine.

The nature and cause of the disease are here evident enough. During the period of pregnancy there had been considerable determination of blood to the womb. A degree of susceptibility, a tendency to inflammatory action had been set up, and this had been increased as the period of parturition had approached, and was aggravated by the state and general fulness of blood to which she had incautiously been raised. The neighbouring organs necessarily participated in this, and the kidneys, to which so much blood is sent for the proper discharge of their function, either quickly shared in the inflammation of the womb, or first took on inflammation, and suffered most by means of it.

* Mr. Storry, speaking of the force with which it is expelled, says, that he has sometimes found the neck of the bladder so contracted that he was compelled to use a catheter.

In other cases there is not this additional local determination. an over-driven bullock is seized with acute inflammation of the kidneys; another that has been shifted from poor to luxuriant pasture is soon observed to have red-water.* There are some seasons when it is in a manner epidemic, when a great proportion of the beasts in a certain district are attacked by it, and many of them die. Atmospheric influence has not been taken sufficiently into the account in the consideration of this and almost every other disease. It is seldom that one dairy is attacked by red-water without many or most of the neighbouring ones being annoyed by it, and especially if the soil and the productions of the soil are similar; and even cattle in the straw-yard have not then quite escaped. It is more prevalent in the spring and autumn than in the winter, and more in the winter than in the summer: it is particularly prevalent when, in either the spring or the fall of the year, warm days succeed to cold nights and a heavy dew. It is peculiar to certain pastures: the farmer scarcely dares to turn even the cattle of the country upon some of them; and a beast brought from a distant farm or market is sure to be attacked. It oftenest occurs in woody districts, and particularly in low marshy lands; but in them there are exceptions, which, in the present state of the botanical knowledge of the farmer and the veterinarian cannot be satisfactorily accounted for. A wall or a hedge may divide a perfectly safe pasture from another which gives the red-water to every beast that is turned upon it. One farmer scarcely knows what the disease is except by name, while on the grounds of his neighbour it destroys many a beast every year. The same pasture is safe at one time of the year and dangerous and destructive at another. The fields surrounded by copses may be stocked with impunity, or advantage, in summer or winter; but the farmer must beware of them when the buds are shooting or the leaves are falling.

The result of general experience is, that it has more to do with the nature of the food than with any other cause; and the production, or the unusual growth of astringent and acrimonious plants may have considerable influence here. The different species of crowfoot, or ranunculus, and also the anemones, and particularly the white-wood (*anemone nemorosa*) and the yellow-wood (*anemone ranunculoides*) have been accused as the most frequent causes of this disease; but instinct will generally warn the animal to avoid sources of evil so palpable as these; and the malady may with more probability be traced to the quality of the general produce of the soil than to the prevalence of certain plants of known acrimonious or poisonous properties.

This noxious quality may be communicated by excess or deprivation of moisture. There is no farmer who is not aware of the injurious effect of the coarse rank herbage of low, and marshy, and woody countries, and he regards such districts as the chosen residence of red-water.

Mr. Ford, in a letter with which the author was favoured from him, says, that "red-water was very prevalent in the neighbourhood of Etruria, in Staffordshire, about twenty years ago before the wet lands were drained. In a dairy of twenty or thirty cows, two-thirds of the number were afflicted with this disease annually, but since the draining not more than one or two annually have been attacked by it. The fair inference is, that swampy land is one cause of the disease, whether from the insalubrity of the atmosphere occasioned by the stagnant water, or from the coarse aquatic herbage with which such land abounds." On the other hand,

* A dairy in my neighbourhood was once removed from a farm on a flinty soil, to one on a strong clay, and every one of them, consisting of seventeen, were affected. Three of them died, *although they had been charmed.*—Letter from Mr. Nobbs.

Mr. Harrison, of Lancaster, says,* that in "the land situated east and south-east of that town, a lofty and wild region, and where, in hot and dry summers, water can rarely, if at all, be procured by the parched animals thereon, red-water rages like an epidemic, annually attacking all ages, and numbers falling victims to it, while in the surrounding valleys a case very rarely occurs." He adds, "I have known red-water make its appearance as an epidemic upon farms where it had hitherto remained unknown except by name, and which could be traced to no other apparent cause than an excess of draining, by which process the natural and artificial grasses had become altered in quality and quantity."

The farmer must carefully observe the effect of the different parts of his farm in the production of this disease, and observation and thought may suggest to him that alteration of draining or manuring, or other management which may to a considerable degree remedy the evil.

Acute Red-water is ushered in by a discharge of bloody urine, and is generally preceded by dysentery, suddenly changing to obstinate costiveness; and as soon as the costiveness is established the red-water appears. There is laborious breathing, coldness of the extremities, ears and horns, heat of the mouth, tenderness of the loins, and every indication of fever: it often runs its course with fearful rapidity, and the animal is sometimes destroyed in a very few days.

When the carcase is examined there is generally found some inflammation of the kidney, enlargement of it, turgescence of its vessels, yet very rarely any considerable disorganization, and certainly not so much affection of it as would be expected; but in cows the uterus exhibits much greater inflammation; there is often ulceration, the formation of foetid pus, and occasionally gangrene; there is also peritoneal inflammation, extensive, intense, with adhesions and effusions, while the lining membrane of the bowels rarely escapes inflammation and ulceration.

There can be little doubt about the treatment of such a disease. There has either been an undue quantity of blood determined to the kidneys with much local inflammation and before the pressure of which the vessels of that organ have given way, or so much blood has been always traversing the kidney, that there is a facility in setting up inflammation there. Bleeding will be the first step indicated. The first bleeding should be a copious one; but the repetition of it will depend upon circumstances. The hæmorrhage, or bleeding, is clearly *active*. It is produced by some irritation of the part: its colour shows that it proceeds from the minute arterial or capillary vessels. When bloody urine flows from the kidney, that organ is giving way under an increased discharge of its natural function, and that function is increased in order to compensate for the suspended one of another part, namely, the natural action of the bowels. Three objects will be accomplished by venesection: the first, a diminution of the general quantity of blood; the second—a consequence of the first—the removal of congestion in the part; and the third is the giving a different direction to the current of blood.

Purgatives should follow with a view more quickly and effectually to accomplish all these objects; and from the recollection of a circumstance most important to the practitioner, that red-water closely followed the establishment of constipation. A pound of Epsom salts should be immediately exhibited, and half-pound doses every eight hours afterwards, until the bowels are thoroughly acted upon.

There is too frequently great difficulty in purging cattle when labouring under red-water: dose after dose may be administered for three or four

* Veterinarian, May, 1833, p. 244.

days, and yet the bowels will remain obstinately constipated. Either there is a strange indisposition in them to be acted upon, or, the rumen sympathising with the derangement of other organs, the muscular pillars of its roof yield to the weight of the fluid, whether hastily or cautiously administered, and the medicine enters that stomach, and is retained there, until the beast is lost. The physic must be repeated again and again; it must gently trickle down the gullet, so that it shall fall on the roof of the paunch with as little force as possible; and, after the second day, in spite of the fever, unusual doses of aromatics must mingle with it, that the rumen, or the intestines, or both, may be stimulated to action. In the majority of cases, and especially before the strength of the animal becomes exhausted, *the commencement of purging will be the signal of recovery.*

It, nevertheless, too often happens that the constipated state of the bowels cannot be overcome, but the animal becomes rapidly weaker, while the blood assumes a darker, and sometimes a purple or even a black colour. The danger is now increased, and, probably, death is not far distant. In many cases, however, the beast not being too much exhausted, the dark and coffee-coloured urine is a favourable symptom, especially if it is discharged in evidently larger quantities and not so frequently.

The appearance of the darker fluid, and even the continuance of the florid red urine, when the fever has subsided to a considerable degree, will indicate a different mode of treatment. The hæmorrhage will have become *passive*. The blood will flow because the vessels have lost their power of contracting on their contents. It has then been usual to give astringents; but this is dangerous practice, for the constipation, which is the worst symptom of the disease, and which immediately preceded the red-water, and was, probably, the exciting cause of it, may be confirmed or recalled. Stimulants, and those which act upon the kidney, will be most likely to have beneficial effect. The common turpentine, the balsam of copaiba, or even spirit of turpentine, especially if it is guarded by the addition of a few drachms of laudanum, may be given with advantage. The weakened vessels of the kidney may occasionally be roused to close on their contents, and the hæmorrhage may be arrested: but the author cannot agree with some of his correspondents, who say that it can easily be cured by almost any diuretic.*

* A remedy of much repute in the neighbourhood of Chester is a very simple and a very ridiculous one. A handful of salt and a handful of oatmeal are fried in a pan until black, and given in a quart of cold buttermilk, the beast being kept without food a little while before. "This," say the credulous, "given once or twice will remove the complaint, *if not too long neglected.*" There is always some salvo of this kind attending the exhibition of these wonder-working medicines. A friend of the author's was standing by when Webb's infallible medicine for the cure of rabies was given to a dog. The animal died about the usual time, and the fellow was reproved on account of the inefficacy of his nostrum: "Oh," replied he, "my medicine got all the madness out of him, you may depend upon it; but you did not support him, and of course he died."

Captain J. Henderson, in his "Survey of Caithness," gravely tells his readers, that when the Highlanders find a beast troubled with red-water, they search either for a trout or a frog, and put it alive down the animal's throat; while others give warm milk as a specific. In Inverness, cold water poured down the throat was formerly esteemed a sovereign remedy; or a decoction of nettles with a handful of salt.

In Dumbarton it is cured by water in which a portion of earth has been infused, with a few leaves of ash or alder.

In Roxburghshire a handful of salt was mixed with a pint of the beast's own blood as it came warm from the vein, and this was poured down his throat.

In some districts of Ireland a very successful preventive was used: the beast was daily drenched with water thickened with clay, until it became accustomed to the pasture.

Some of the farmers in Norfolk used to give a quart of churned milk, and a handful of salt. Others gave a quart of round coal reduced to powder, or a quart of coal ashes mingled with a quart of spring water, and this was deemed to be infallible.

Chronic red-water is more prevalent than that which is acute, and, in its first stage, is far more a disease of the digestive organs, and especially of the liver than of the kidney. The urine is observed to be of a *brown colour, or brown tinged with yellow*; the beast feeds nearly as well as before, but ruminates rather more lazily. In a few days a natural diarrhœa comes on, and the animal is well at once; or a purgative drink is administered, and a cure is presently effected. This occurs frequently in cows of weak constitution and in calves.

At other times there is manifest indisposition: the animal is dull, heavy, languid—the ears droop—the back is bowed—she separates from the herd—she refuses her food—she ceases to ruminate. Presently she gets better—she rejoins her companions; but this is only for a little while.* *The urine, which at first was brown, with a tinge of yellow, has now red mingling with the brown, or it is of the colour of porter.* It is increased in quantity—it is discharged sometimes with ease, at other times with considerable straining—in little jets, and with additional bowing of the back. The milk diminishes—it acquires a slight tinge of yellow or brown—the taste becomes unpleasant—it spoils all that it is mingled with. The pulse is accelerated—it reaches to 60 or 70. If blood is drawn, the serum which separates from it is brown. The skin is yellow, but of a darker yellow than in jaundice—it has a tinge of brown. The conjunctiva is also yellow, inclining to brown. The urine becomes of a darker hue—it is almost black. The animal usually shrinks when the loins are pressed upon; occasionally there is much tenderness, but oftener the beast scarcely shrinks more than he is accustomed to do when labouring under almost every disease. The belly is not so much tucked up as drawn together at the sides. There is considerable loss of condition—the legs and ears get cold—the animal is less inclined to move—there is evident and general debility. In every stage there is costiveness, and that exceedingly difficult to overcome, but, on close inquiry, it is ascertained that there was *diarrhœa at the beginning, and which was violent and fœtid, and which suddenly stopped.*

Mr. Dickens, of Kimbolton, says, that “a few years back there was a gentleman living in Huntingdonshire who was very celebrated for the cure of red-water, and his son, a most respectable farmer, tells me the following was his never-failing recipe: Bol. armenian ʒii. a handful of salt, and a strong decoction from the common nettle; of this he made a drink which he used to sell for 2s. 6d.”

Mr. T. Browne, of Hinckley, says, that red-water is not very common in his neighbourhood; and that he knows but of one farm that is subject to it: this farm lies in a low damp situation, and the farmer cures it by the administration of brandy.

Mr. Ford, speaking of the treatment of red-water in the neighbourhood of Etruria, says, that “some use astringents, as rock alum, tincture of cantharides, and the juice of nettles; some give writing paper boiled to pieces in skimmed milk; while others give Epsom or Glauber’s salts, or common kitchen salt, in order to counteract the tendency to constipation, and leave the disease itself to the effort of nature, which usually stops the blood after a greater or less degree of exhaustion.”

In a book which is found on the shelves of many agriculturists, and a very useful one so far as the general treatment of cattle is concerned, the following remedy for red-water stands recorded: “Take two or three handfuls of stinging nettles, and boil or stew them slowly in three quarts of water until reduced to one quart; when cool, give it to the beast. Then having ready a pint of common salt, put it into a quart bottle filled up with chamber lye; shake it well until the salt be dissolved, and immediately give it to the beast. This remedy I believe to be infallible, and my success in this disorder has led me to many other discoveries. It is a doubt with me whether the nettles have anything to do with the cure, as I have known this disease cured with buttermilk and pig’s dung, and a frog with a large quantity of cold spring water; but I have known each of these remedies to fail; the former prescription never.”—*Parkinson’s Treatise on Live Stock*, vol. i. p. 243. But enough of this absurdity!

* The author, however, has one case strong in his recollection, in which there was a respite of several months, and that repeated three times, but every cow in the dairy at length perished.

Examination after death shows the skin and the cellular membrane underneath to be of a dark yellow; the fat about the belly is of the same hue, or perhaps of a lighter tinge. The first and second stomachs are full. there is no fermentation and little gas, or sour smell. The manyplus is perfectly dry—baking could hardly add to the hardness—were it not for its weight it might be kicked about as a football. The leaves of the manyplus cling to the food contained between them: the papillæ leave their evident indentations on the hardened mass, and that mass cannot be detached without considerable portions of the cuticle clinging to it. The fourth stomach is empty, and the lining membrane covered with brown mucus, exhibiting patches of inflammation underneath. The intestines are rarely inflamed. There is no fluid in the belly, nor inflammation of its lining membrane. The kidney is of a yellow-brown colour, and sometimes a little enlarged, but *there is rarely inflammation or disease about it*. Drops of dark and brown-coloured urine may be pressed from it. The lungs display no mark of dangerous disease, but they too have a yellow hue. The fluid in the bag of the heart is yellow. The chyle, which is traversing the lacteal vessels, is yellow too, and there is the same discolouration of the fluids everywhere.

The liver is evidently of a darker colour; it is enlarged, generally inflamed, sometimes rotten, and filled with black blood. The gall-bladder is full, almost to distension. The bile is thick and black: it looks more like lamp-black mixed with oil, than like healthy bile.

All these appearances lead to the necessary conclusion that this is far more a disease of the digestive organs than of the kidney; in fact, that it is not primarily an affection of the kidney. It is disease of the liver, either consisting in inflammation of that organ, accompanied by increased secretion of bile, or a change in the quality of the bile. In consequence of this the whole circulatory fluid becomes tinged with the colour of the bile, and which is shown in the hue of the skin generally, and in the colour of the blood, and particularly in the change that takes place in that blood when drawn from the vein.

The fluid discharged from the kidneys participates in the general change; it becomes yellow—yellow-brown—brown. The change is most evident here, because so great a quantity of blood, in proportion to the size of the organ, circulates through the kidneys; and more particularly it is evident here, because it is the office or duty of the kidneys to separate from the blood, and to expel from the circulation, that which is foreign to the blood, or would be injurious to the animal.

The bile, however, possesses an acrid principle to a considerable degree. While it is an excrementitious substance that must be got rid of, it stimulates the intestinal canal as it passes along in order to be discharged; it particularly does so when it is secreted in undue quantities, or when its quality is altered. There is abundant proof of this in the bilious irritation and diarrhœa which cattle so frequently exhibit. The kidney, at length, is evidently irritated by the continued presence of this diseased fluid: it becomes inflamed, its minute vessels are ruptured, and a red hue begins to mingle with the brown. There is found discolouration and increased size of the kidney, and pain in the region of that organ; this, however, is rarely carried to any considerable extent, and the seat and principal ravages of disease are to be clearly traced to a different part, namely, the liver.

It is with peculiar pleasure that the author refers to the opinion of Mr. Harrison: * "That chronic indigestion in cattle is a principal cause of most diseases to which they are incident, has long been observed by me.

* Veterinarian, May, 1833. p. 244.

Hæmaturia, (red-water,) I am perfectly convinced, owes its origin to it, at least in the generality of cases; and I feel quite assured that the discoloration of urine is entirely referrible to that cause, and not to any nephritic affection, as is too generally, and oftentimes fatally supposed."

Mr. Friend is much of the same opinion. "This disease appears to be one brought on also by indigestion. There are certain pastures which seem peculiarly to produce it, and certain seasons which seem equally to predispose towards it. Where the facts of the case can be got at, it is generally found that the mucous membrane of the intestines is first affected, producing diarrhœa; though this always extends as the disease proceeds to the peritoneal coat, and probably to the whole substance of the intestines, and the most obstinate costiveness is the result." *

It is evident, then, that *acute* and *chronic* red-water, as the author of this treatise has termed them, (for he did not, in the present state of our knowledge of cattle medicine, dare to deviate too far from the usual arrangement and designation of disease,) are essentially different maladies: they belong to different organs—they are characterised by different symptoms—they require different treatment. The first is inflammation of the kidney; it is characterised by the evident pain and fever, and by the red and bloody urine which accompanies it in an early stage; it requires the most active treatment, and it speedily runs its course. The second is inflammation of, or altered secretion from, the liver; not often accompanied in its early stage by pain or fever; characterised by the dark brown colour of vitiated bile, and more slowly, but as fatally, undermining the strength of the constitution.

As to the first step in the treatment of chronic red-water, there is a difference of opinion among veterinary surgeons; many strongly recommend bleeding, and others as strenuously deprecate it. The truth is, that the propriety of bleeding depends on the condition of the beast, and the degree of fever. An animal in high or in fair condition can never be hurt by one bleeding; while, on the contrary, lurking, deceptive, fatal febrile action may be subdued. If there is the slightest degree of actual fever, nothing can excuse the neglect of bleeding. The quantity taken, or the repetition of the abstraction of blood, must be left to the judgment of the practitioner.

On the next step there is not a difference of opinion among well-informed men. The animal must be well purged if he is in a constipated state; or if there is already a discharge of glairy fæcal matter, the character of that must be changed by a purgative. There has been dispute, and more than there needed to be, as to the nature of the purgative. That is the best whose effects are most speedily and certainly produced, and there is no drug more to be depended upon in both these respects than the Epsom salts. It may be alternated with Glauber's salts, or common salt, or an aperient of a different character, sulphur, may be added to it. Much good effect is often produced by this mixture of aperients. Mr. Friend is a strenuous advocate of sulphur combined with Epsom salts; and, as there is either so much real costiveness—indisposition to be acted upon by purgative medicine—or so much relaxation of the floor of the œsophagean canal that the medicine falls into the rumen instead of going to its proper destination, and as the establishment of purgation seems to have so uniform and beneficial an effect in relieving the disease, the medicine that is adopted should be given in a full dose. It should consist of

* Veterinarian, June, 1

at least a pound of Epsom salts, and half a pound of sulphur, and this should be repeated in doses consisting of half the quantity of each, until the constipation is decidedly overcome.

It is imperatively necessary that the practitioner should have made up his mind as to the real nature of the disease; for although he might, in inflammation of the kidney, fear to weaken by active purgation an animal that was likely to be speedily debilitated by excessive loss of blood, (yet that fear would generally be destitute of all reasonable foundation,) and would be tempted to try whether the hæmorrhage might not be arrested by astringents or stimulants, it would scarcely need a moment's reflection to convince him that he must check this excessive discharge of vitiated bile, or divert it from that organ which is chiefly suffering under its influence. Most of all he would be convinced, that he must restore the liver to a healthy discharge of its natural functions; and that he can best accomplish these purposes by freely opening the bowels, and in fact by no other means accomplish them. Stimulants would be dangerous, and astringent medicine would be actual poison in this disease.*

It will not be forgotten that the precautions already recommended should be carefully observed, in order to give the physic the best chance of passing into the bowels; that the patent pump should be in frequent requisition for the administration of clysters; and that when purging is once induced, a lax state of the bowels should be kept up by means of the frequent repetition of smaller doses of the medicine. The diet should consist principally of mash, gruel, linseed tea, fresh cut young grass, young and fresh vetches, and a few carrots. The conclusion of the treatment will be best given in the language of Mr. Friend: "I generally find it necessary to administer the Epsom salts in doses of four or six ounces, as an alterative, for a few days afterwards; to which, if there exists any debility, I add two drachms of the calumba powder, (gentian has better effect,) and one drachm of ginger."†

* Mr. Friend relates an anecdote that well illustrates this: "Sir," said a farmer once to him, (alluding to his having lost a beast with this disease,) "the farrier cured the beast of his staling blood well enough, but somehow his drinks dried his body up, and killed him."—*Veterinarian*, June, 1833, p. 299.

† *Veterinarian*, May, 1833, p. 245. The Highland Society of Scotland offered in 1830 a gold medal, or ten sovereigns, for the best essay on the causes, prevention, and cure of red-water. There were seven competitors, whose essays were published in the "*Quarterly Journal of Agriculture*," for May, 1831. The history of this prevalent and fatal disease cannot, perhaps, be better concluded than by a condensation of the substance of these papers. At that period they were the only publications of the slightest value on this important subject, and some of them reflect a high degree of credit on the authors.

One competitor was a farmer; and although there are very strange notions of this disease prevalent among agriculturists, yet the opinion of a sensible practical man is always valuable. Mr. W. A. SLAKER, of Ardifny, Aberdeenshire, states, that cows after calving, and calves after the milk is taken from them, are most liable to red-water; that it is most prevalent from the beginning of January to the end of April; that sudden transitions from heat to cold, and dry stimulating food, and *costiveness*, the natural consequence of the latter, or otherwise produced, are the chief *causes*. By way of *prevention*, he recommends that cows should be bled before calving, and that the bowels should be kept moderately open by occasional doses of common salt dissolved in water. As a *cure*, he gives twenty ounces of Epsom salts in warm water, and half an hour afterwards two quarts of gruel with half a pound of butter dissolved in it; half the quantity of the gruel and butter to be repeated every two hours; the physic to be repeated, if necessary, at the expiration of twenty-four hours; and, should the constipation be obstinate, clysters composed as follows should be frequently administered:—boil an ounce of aniseed in a quart of water, strain the clear liquor, and dissolve in it four ounces of butter, and a tablespoonful of salt. To calves he gives four ounces of Epsom salts, and half an ounce of nitre, with the same kind of gruel. He often finds the mannyplus so dry that it might almost serve for fuel. He considers that more animals die of the fever by which the disease is accompanied than by the loss of blood, and thinks it of the utmost consequence

BLACK-WATER.

This is only another and the concluding stage of RED-WATER. When it follows the acute or inflammatory disease, it may be considered as a favourable symptom if the urine contains no purient matter, and has no

to keep the bowels open. Mr. Slaker writes like a sensible man, and would beat many a veterinary surgeon out of the field.

Mr. A. HENDERSON, land surveyor, Edinburgh, was bred a farmer, and had afterwards most extensive opportunities of observing this disease, and of which he appears to have diligently availed himself. He considers queys and cows most liable to red-water, which occasionally prevails at all times, but is most prevalent in cold spring, or long-continued dry summer weather. The *causes* are various: scarcity of water in summer,—the drinking of bad or stagnant water,—change of pasture, particularly from fine to coarse quality, yet often observed on a light soil, during a dry and hot season, and when cattle on a deeper soil would escape, and when on that soil, in a moist season, not one would be affected,—change of atmospheric temperature,—strains,—bruises,—or anything that may excite inflammation in the kidneys or neighbouring parts. When cattle were journeying, he observed that twenty females were attacked for one male, and particularly such as had had calves,—that at the commencement of the journey the disease was rarely very prevalent, provided there was a constant supply of water, and the weather proved steady,—that want of water and sudden changes of weather soon produced it,—that the tendency to it was increased by strains and bruises, and the cattle fretting, and riding upon each other, and by the unmerciful blows of the drivers, for those that fell behind, and were thus exposed to mal-treatment, were most frequently affected. It was his opinion, that it was more an accidental disease, and brought on by ill treatment, than a constitutional or epidemical one; yet some animals of the same breed and age were more subject to it than others, and those that once had the disease were more apt to be again affected by it.

Prevention.—A supply of pure water—the cattle not being put on change of pasture, and particularly of inferior quality, when hungry—not being put on rough, coarse pasture in summer, nor fed on heated hay in winter—not being put at once into a damp, cold pasture in the evening, after having been overheated during the day—and when the disease commences in a stock, a little blood being taken from all of them.

Cure.—Removal to some moderately warm, dry, and sheltered place; bleeding; purging with common salt. In more advanced stages, and when the inflammation is subdued, two ounces of Castile soap, one ounce of bole armenian, half an ounce of dragon's blood, and one drachm of rock alum, in a quart of warm ale or beer. (?) In the still later stages the same drink, or occasionally a cordial one; clysters, and a stimulating embrocation to the loins.

Next stands Mr. A. WATT, druggist, Kintore. Every one who is really acquainted with the treatment of the diseases of cattle, views an essay on cattle medicine by a druggist south of the Tweed with a great deal of suspicion; and there seems to be cause for that suspicion further northward. It is strange that the Society should have admitted a paper recommending so many deadly poisons; and if a portion of it is here extracted, it is that the readers of the Farmer's Series may be warned against so murderous a practice: "A liberal use of opium, with mercurials, alkalies, sulphuric acid, turpentine, ether, and nitre, is the best practice. I have found the annexed recipe to answer better than any yet tried, as out of 200 trials it only failed in four: take of tincture of opium half an ounce, sulphate of potash half an ounce, sulphuric acid sixty drops, spirit of hartshorn one ounce; mix, and give in a bottle of new milk: repeat every eight hours. If there should be costiveness, injections of butter, green oil, and warm water, should be employed. Loss of the hoofs and part of the tail may be prevented by rubbing the back and legs with salt brine twice a day for a week after the disorder has been subdued."

The veterinary surgeon is always glad when the scientific practitioner of human medicine condescends to bestow some attention on the diseases of domestic animals. Dr. JAMES BAYNE, of Oatfield, Inverness, favoured the Society with a paper on red-water. If he is a little in error when he says that the disease is most severe and obstinate in males,—that bulls are particularly liable to it,—and that it generally makes its appearance during the summer months, and in the beginning of autumn, but *never* in winter and spring; yet his mode of cure is simple, scientific, and effectual. It forms a singular and pleasing contrast to that which was last mentioned. On the first appearance of the disease the animal is confined to the house or yard, and from half a pound to a pound and a half of Glauber salts administered; and if there is much appearance of fever, about a quart (qy. four or five quarts?) of blood is taken from the neck; and if costiveness is present, frequent injections of warm water are administered. He has frequently injected a pailful at a time. During the continuance of the disease the animal should not be allowed to go out to pasture, but small quantities of cut grass should be given.

unpleasant smell. It shows that the blood is not discharged so rapidly and forcibly as it was; and that it hangs about the mouths of the vessels, or is contained in the cavity of the kidney, or in the bladder sufficiently long to be changed from arterial to venous blood, and the practitioner will be encouraged to proceed in the course which he had adopted: but if purulent matter mingles with the black blood, it indicates the sad extent of the mischief that has been done. It is a proof of ulceration, if not of gangrene, and shows that a degree of disorganization has taken place which must speedily terminate in death.

If in chronic red-water, or that which depends on disease of the liver, the discharge becomes of a darker and still darker brown, until it has

The three other competitors for the medal were veterinary surgeons.

Mr. B. W. LAING, of Banchory Ternan, Aberdeenshire, states, that in his district red-water occurs most frequently in autumn, winter, and the early part of spring; and is produced by want of exercise, want of access to earth, every cause of costiveness, the use of barley, and chaff, and the sudden setting in of frosty weather. As *preventives*, he recommends as much liberty as possible during the winter,—bleeding and physicking two or three weeks before calving,—thawing the turnips in frosty weather, and giving no boiled food or grain. As a *cure*, he has recourse to bleeding; he then gives, *in the form of balls*, twelve drachms of Barbadoes aloes, three of calomel, and an ounce of Castile soap; twelve hours after the administration of which he administers two ounces each of Epsom salts and common salt in cold water: after this, occasional doses of linseed oil are given until the physic operates. He then has recourse to the following drink, which is continued morning and evening until the water becomes clear: acetate of lead half a drachm, alum two drachms, and catechu two drachms, dissolved in boiling water, and given blood-warm. Immediately after this, two *gills* of vinegar, mixed with a bottle of cold water, are horned down. Surely, if the medicine is not deprived of much of its astringent power by the decomposition which must necessarily take place, this is almost as injudicious a practice as that of Mr. Watt, the druggist of Kintore.

Mr. PETER SMITH, of Ardgethan, Aberdeenshire, stands next on the list. Although the reasoning on which it is founded may not be perfectly admissible, or, rather, it is too complicated to be easily understood or assented to, yet he adopts the very proper conclusion that red-water is not a local, but a constitutional disease. He would *prevent* it by administering aperient medicine during those states of the constitution, and under those circumstances, and at those periods of the year when an attack of the disease is most to be dreaded. As a *cure*, he places his chief dependence on purgation. He begins with a pound and a half of Epsom salts, and half a pint of castor oil, and this is soon accompanied by injections containing common salt and butter. The purgation is repeated every twelve hours, *until the urine becomes clearer*. When this has been accomplished he diminishes the dose, but he keeps the bowels under the influence of the medicine until the animal is quite recovered. Succulent vegetables are given at first, but after the bowels are well cleaned, and the urine becomes clearer, the cow may be allowed the moderate use of straw or hay. In bad cases, he inserts a blister in the dew-lap. When the animal is getting better, he gives half an ounce of each of carraway, aniseeds, and spirit of hartshorn.

Mr. Smith remarks, that in his neighbourhood red-water occurs during the summer months to cattle out at pasture; that animals reared in the district are rarely affected by it, but those from a district where the *darn* (the provincial name of this disease) does not occur, are almost sure to be seized with it; and that the inhabitants when purchasing cattle are careful to ascertain whether they are *darn-bred*, that is, whether they come from a district where darn prevails. The inhabitants attribute the disease to the wood anemone, (*anemone nemorosa*), and give that plant the name of *darn-grass*, and which, they say, is a rare plant where darn does not occur, but is very common in the darn district. Mr. Smith's essay does him much credit.

The seventh competitor, and the most deserving, is Mr. R. Thomson, now of Beith. After a most accurate detail of symptoms, he states it to be his opinion, that it is the black, inspissated bile, which, taken up by the absorbents, and passed into the blood, colours all the secretions. He believes purgatives of any kind, given in large quantities of water, to be the best medicine that can be employed, and he prefers common salt. He continues his purgative, with plentiful dilution, until the bowels are well opened; and he afterwards keeps them in a lax state by administering linseed oil. Diuretics and astringents combined can be only of service when the bowels are open; and even then, the improper administration of them often causes inflammation of the bowels and kidneys. If the bowels are kept open by laxatives, the disease will generally disappear without their use.

Veterinary

assumed an almost black character, it shows either that the system is loaded with a superabundance of this empoisoned secretion, and of which it cannot rid itself, or that the irritation caused by the continued presence of so acrimonious a fluid is producing inflammation, gangrene, and death in the vessels that are filled and oppressed by it. Mr. Thomson well describes this:—"In the last stage of the disease, when the urine assumes a darker brown or black colour, no remedy seems to have any efficacy; the animal is sunk beyond recovery, and he stretches himself out and dies as if perfectly exhausted."*

INFLAMMATION OF THE KIDNEYS

Cattle are occasionally subject to an affection of the kidneys bearing considerable resemblance to acute red-water, but attended by more of the symptoms of pure inflammation of that organ in other animals. At first there are seldom any indications of disease beyond a straining effort in voiding the urine, and which is ejected forcibly and in small quantities, the loins being more than usually tender, and, perhaps, a little hot. In a day or two afterwards, however, the beast becomes dull, and careless about his food; the difficulty of staling increases; blood is perceived to mingle with the urine; the muzzle becomes dry; the horns and ears cold; the pulse frequent and hard, and the breathing quickened. Diarrhœa or dysentery is now observed; the evacuations are fœtid; they too are discharged with effort and in diminished quantities, and at length cease to appear.

The difficulty of passing the urine becomes rapidly greater; the beast strangely bows his back, and groans from intensity of pain; at length total suppression of urine ensues; cold sweats break out, principally about the back, sides, and shoulders, and the patient trembles all over; he moans continually, but the moaning gets lower and lower; he becomes paralysed behind; the pulse can scarcely be felt; the animal falls; he is incapable of rising, and he dies in three or four days after the apparent commencement of the attack.

This is especially a disease of the spring time of the year. It is the consequence of over-nourishment: there is a predisposition to inflammation; and from some cause, more or less apparent, that inflammation is directed to the kidney. The treatment will comprise plentiful bleeding, active purging, the administration of emollient clysters, fomentation over the loins or the application of a mustard poultice to them, bran mash, gruel, and a small quantity of green succulent food. There is a connexion between all these affections of the kidneys, and inflammation of the larger intestines lying in the neighbourhood of them; thence the previous dysentery, and the often obstinate constipation of red-water and pure inflammation of these organs; and thence the necessity of large and repeated

Veterinary practitioners and agriculturists generally, are much indebted to the Highland Society of Scotland for the publication of these papers. However objectionable may be the treatment recommended in two of them, they all contain some useful hints, and that by Mr. Thomson comprises the substance of that treatment which is founded on principle, and will be attended by success where success can be attained.

The following extract from a letter just received from Mr. Steel, V. S., of Biggar, N. B., is strongly confirmatory of the opinion the author has expressed of red-water, viz.: that it is far more a disease of the digestive than of the urinary system, and that the liver is the organ principally affected. He is describing a case of acute red-water. He says,—“The uterus had spots of inflammation, the gall-bladder was filled with a fluid resembling the urine which the cow was passing, the mannyplus was rather hard and dry, and the kidneys had a relaxed bleached-like appearance.—The blood, when it is drawn, very much resembles the urine; and there is sometimes no other difference, than that the blood coagulates, and the urine does not.”

* Quarterly Journal of Agriculture, May, 1831, p. 12.

doses of purgative medicine, but from which all stimulating ingredients should be excluded, and which would probably, in these cases, best consist of castor or linseed oil. The clysters also should be truly emollient, that while they assist in opening the bowels, they may act as soothing fomentations in the neighbourhood of the inflamed organ. Both the oil and the clysters should be continued until the inflammation has perfectly subsided. To the use of these the treatment should generally be confined—most certainly in no part of it should the slightest portion of diuretic medicine be administered.

THE KIDNEYS AND BLADDER.

The urine secreted, or separated by the kidney, having first accumulated in the cavity in the centre of that organ, is conveyed through a duct called *the ureter* to a more capacious reservoir, *the bladder*. The kidney of the ox is larger and better defended than that of the horse, on account of the increased importance of its function in an animal that is to furnish us with milk while living, and more solid food when dead. The ureters also are considerably larger; the internal membrane is stronger; the opening into the bladder is even nearer to the neck of that vessel than in the horse, and the ureters terminate much nearer to each other. Comparative anatomists also know that there are not any *renal capsules* in the ox. These are small, elongated, irregularly formed bodies, placed opposite to the kidneys, and between these organs and the spine. Their function is a subject still wrapped in utter obscurity.

The BLADDER of the ox, larger, longer, and of a more oval form than that of the cow, is lodged between the rectum and the internal surface of the lower bones of the pelvis. It is supported by a transverse ligament, which ties it to the sides of the pelvis; while it is attached by cellular membrane to the rectum above and to the pelvis below. It is confined entirely to the cavity of the pelvis, for one of the compartments of the paunch affords an insuperable obstacle to its entering the proper cavity of the abdomen. When distended by urine, its increase of size is principally shown by its greater roundness, and not, as in the horse, by its increased length and descent into the cavity of the belly. In examination and in operation for stone in the bladder this should not be lost sight of. It has three coats: the outer and peritoneal; the central or muscular, which is not so thick as in the horse, and consequently the force with which it contracts upon and expels the urine is not so great; and the inner coat, which is lined with numerous glands, that secrete a mucous fluid in order to defend the bladder from the acrimony of the urine.

The bladder terminates in a small neck, around which is a continuation of the common muscular coat, or, in the opinion of some, a distinct circular muscle, whose natural state is that of contraction; so that the passage remains closed, and the urine retained, until, the bladder being stretched to a certain extent, the fluid is expelled either by the will of the animal, or the involuntary contraction of the muscular coat. This muscle, or this portion of the muscular coat, is considerably weaker in the ox than in the horse, for the intestines pressing upon the bladder are not so voluminous; and in the slow motion of the ox this vessel is not exposed to those concussions which it often experiences in the rapid progression of the horse, and in which the bladder has occasionally been ruptured. Advantage may be taken of this weakness of the sphincter muscle, for in retention of urine, or when, for the purpose of some operation, it may be expedient to empty the bladder, the slightest pressure upon it by the hand introduced into the rectum will readily effect it.

Having passed the sphincter muscle, the urine flows through the *urethra* and is evacuated. This canal is longer and smaller than it is in the horse; it also pursues a more tortuous path than that of the horse. The peculiar form and direction of some of the muscles of that region compel the penis to take a kind of double curve, not unlike an S, before it takes its ultimate straight course; and on these accounts the ox suffers oftener than the horse from the entanglement of calculi in the folds of the urethra.

The bladder of the cow is smaller and rounder than that of the ox. The rumen is as large as in the ox, and occupies the greater part of the abdomen; but additional room must be left for the impregnated uterus, and that is effected in some measure at the expense of the bladder: while also, to obviate the ill effects of occasional pressure in the distended state of the uterus, the sphincter muscle at the neck of the bladder of the cow is much larger and stronger than the same muscle in the ox.

The circumstances of disease to be considered with reference to the bladder are the foreign bodies, principally calculi, which it may contain; the inflammation resulting from that or from other causes; rupture, and inversion of it.

URINARY CALCULI.

Concretions are oftener found in the urinary passages of cattle than of the horse. Perhaps there is greater tendency to their formation in these animals. One cause of their retention may arise from the different form of the passages. The urethra has been described as smaller in cattle than in the horse, and therefore many calculi that would pass away with the urine in the one are retained in the bladder of the other, and thus become the nuclei of larger concretions, or the centre around which other matter collects, layer upon layer. It is probably on this account that calculi are found so much oftener in the ox than the cow; in the former the urethra is long and small, in the latter it is short and capacious.

The increased function discharged by the kidney in cattle may likewise account for the more frequent formation of calculi. When so much more blood passes through this organ in order that the useless or excrementitious parts of it may be expelled, the supposition is not unreasonable that a greater portion of the substances of which urinary calculi are composed will be found. The food of cattle may have much to do with it; and the greater proportion of earthy matter which they swallow, whether in the first rude cropping of the herbage, and the carelessness with which they often tear it up by the root, or the earth which they sometimes voluntarily take in order to prevent the development of acidity in the stomach, or to remove it.

The urinary calculi that have hitherto been examined have been found to be composed of nearly the same materials, and in proportions not often varying. They have chiefly yielded carbonate of lime, a small quantity of carbonate of magnesia, some traces of phosphate of lime, and a certain quantity of mucus, which has served as cement between the different layers that have accumulated around a central point. The form of the calculus has considerably differed. When there has been but one central nucleus, the form has been more or less circular; but in the majority of those which have fallen under the writer's observation, the stone has acquired magnitude by the union of various small distinct calculi. The form of the collected mass has consequently been exceedingly different in different specimens.

STONE IN THE KIDNEY.

One instance only of this has occurred in the author's practice, and he

is not aware that any other is on record. It was supposed to be a case of acute red-water, or inflammation of the kidney, and was treated as such. The cow was bled and repeatedly physicked, but with variable and no satisfactory relief. Great pain was always expressed while the urine was voided; at other times there appeared to be colicky spasms; there was excessive tenderness on the loins, and some heat. The treatment continued five days; there was no amendment, and she began to lose flesh; but being yet in tolerably fair condition, she was destroyed.

There was considerable peritoneal inflammation, in which the intestinal convolutions in the neighbourhood of the right kidney were involved. It was evident, before the fatty capsule of the kidney was cut through, that the seat of disease lay in that organ. It was enlarged to nearly double its natural size, and was much inflamed. Its cavity was filled with a yellow muco-purulent fluid, in which were a great many calculi; some were scarcely larger than sand, but three were of the size of a kidney-bean. There was no inflammation of the ureter or the bladder, nor was any thing unusual found in them.

These calculi were irregularly formed—very light—porous—and of a yellow colour, deepening into brown. They were probably formed from the superabundance of that acid principle which is always found in the urine; and had a similar sandy substance, or small grains resembling coarse sand, been previously observed in the urine, it is possible that some good might have been done. The floor of the cow-house, and sometimes bare places in the field, will show where a considerable quantity of gritty matter has been discharged. This indicates a diseased state of the urine at the time, not perhaps sufficiently serious to interfere materially with the general health, but which may eventually lead to the formation of stone in the bladder or kidney, or to other serious maladies. The sandy matter is either white, approaching to grey or yellow; or it is brown, with varying shades of red or yellow.

Chemists have now satisfactorily ascertained the nature and causes of these discharges, and the means of remedying them. The light-coloured granules show deficiency, and the dark-coloured prove excess, of acid in the urine. In the one there is a deposit of earthy matter from deficiency of acid, and in the other there is a crystallization of the acid itself. In the one, cream of tartar, or dilute sulphuric acid might be administered with advantage; and in the other, earth, or a portion of chalk mixed with common loam, may be placed before the beast, or doses of carbonate of soda may be given. Danger is most to be apprehended from the white deposit, which is frequently the precursor or the accompaniment of gravel—a deposition in the bladder to which cattle are far more subject than farmers or agriculturists are usually aware.

STONE IN THE URETERS.

There can be no doubt that many calculi descend from the cavity or pelvis of the kidney through the ureters into the bladder; yet there is but one case of it on record. While the kidneys of cattle are considerably larger than those of the horse, the ureters are more than proportionably increased in bulk, and calculi of a moderate size readily pass through them.

The case is briefly and somewhat unsatisfactorily related by Hurtrel d'Arboval. He says* that Gattoin had sent to the Royal and Central Society of Agriculture a history of the sickness and the examination of a cow, in the left ureter of which many calculi were found, that had pro-

* Dictionnaire de Méd. et Chirurg. Vét., CALCULI.

duced considerable dilatation of that canal, retention of urine above them, and all the symptoms that had preceded death. They were of a brilliant metallic bronze colour; they were polished, irregular, and heavy. One of them was composed of several united together, and presented a very singular triangular form.

Chabert, according to Hurtrel d'Arboval, thinks that the presence of these calculi in the ureters might be detected by introducing the hand into the rectum. He does not seem to speak from experience; but he says, that in case of deficiency in the urinary discharge, accompanied by pain and fever, and tenderness on the loins, and especially by suppression of urine, he should endeavour to explore the ureters in this way. From the situation of the bladder in the pelvic cavity, this might be accomplished through the greater part of the course of the ureters. If calculi were detected in these passages, the practitioner should endeavour to force them on into the bladder, and, not being able to accomplish this, and knowing that the beast must otherwise die, he would perhaps have recourse to the dangerous operation recommended by Chabert,—he would cut through the rectum and the ureter, and extract the stone.*

STONE IN THE BLADDER.

It is with the calculus that has descended into the bladder and there increased in size, or that was originally formed there, that the practitioner will have most to do either while it continues in the bladder, or in its after progress through the urethra.

The symptoms that would indicate stone in the bladder are somewhat obscure. There are many that prove plainly enough a state of suffering, and of general excitation or fever;—rumination ceases—the mouth is hot—the flanks heave—the animal is continually lying down and getting up again—it is looking mournfully towards its flank. Then comes a peculiar trembling of the hind limbs, and the frequent straining to void urine,—a straining at some times quite ineffectual, at other times producing the discharge of a small quantity, and that occasionally mingled with blood. These symptoms will direct the attention of the practitioner to the urinary organs. In order to ascertain the nature of the complaint, he will introduce his hand into the rectum. The bladder will easily be detected. It will probably be distended by urine: he will gently press upon it, and the contained fluid will be expelled, and if there is a calculus in the bladder it will be readily felt. He must not, however, be alarmed if this pressure should at first produce violent pain resembling colic—he must desist for a few minutes, and try again. A sound could not be used for the purpose of detecting the calculus, nor even the flexible catheter that is of such admirable use for the horse.

There are two courses to be pursued in such a case,—either to slaughter the animal immediately, if it should be in tolerable condition, or to remove the stone by the usual operation of lithotomy. All attempts to dissolve the calculus by the use of muriatic or any other acid will be as fruitless as they have proved to be in the human being; and the length and small calibre of the urethra, as well as its double curve, prevent the possibility of having recourse to the safe and effectual operation of breaking down the stone within the bladder.

The beast being cast, and properly confined, the operator will recollect a very material difference in the construction of these parts in the horse and the ox. In the horse, he would be able to pass a stilet up the urethra as

* Dict. de Méd. et Chirurg. Vét., CALCUL.

far as its curve into the pelvis, and to make his first and chief incision at once; but in the ox, on account of the length of the penis, or for other reasons, two muscles descend from the anus, and pursue their course until they arrive at about the middle of the penis, a little in front of the scrotum: there they attach themselves to the penis, and draw it up, and force it to bend or curve upon itself; and it takes, as has already been stated, the form of an inverted *S*. No stilet can be forced through such a double curvature. The operator must either cut down on the urethra, without any stilet within to guide him, at the point where again, below the anus, it curves round the pelvic bones in order to enter the pelvic cavity, and which, if he is a tolerable anatomist, and proceeds with some caution, he may readily accomplish; or he must get rid of the first curve, and that may be effected without much difficulty. The hair must be cut off immediately in front of the scrotum; a longitudinal incision must then be made, six inches in length, through the sheath, upon the penis, and in the direction in which it lies. The penis being exposed, it is seized and drawn forward in its sheath; the muscles relax, the penis is readily brought into a straight direction, and held so for a sufficient time to admit the introduction of a stilet, which should either be composed of whalebone, and very flexible, or it should be made of iron, and jointed, resembling that used for the stone operation on the horse by Mr. Taylor, of Nottingham.* The more flexible the catheter is, the more readily it will accommodate itself to the tendency of the muscles to restore the inverted *S* curve, and the more readily likewise may it be bent round the bony arch beyond, and so diminish the length of the incision which must afterwards be made between the anus and the scrotum.

The sound being passed through the curvature thus temporarily removed, and its point felt below the anus, the operator must cut into the urethra at that part. Into this opening he must introduce another rod, straight and grooved, and pass it on into the bladder; and then, by means of a probe-pointed bistoury running in this groove, the incision must be carried on to the side of the anus, and through a portion of the neck of the bladder corresponding with the supposed size of the calculus. The operator must then pass his right hand into the rectum, and the two first fingers of the left hand into the bladder, and with the right hand guide the calculus between the fingers of the left hand, by which, or by means of a pair of forceps pushed into the wound, it should be seized and extracted.

It is not always that there will be much bleeding, or that it will be necessary to take up any of the vessels, or even to pass any sutures through the edges of the wound, unless the incision has been more than usually large. The urine will for a few days be principally passed through the wound, but a portion of it will soon begin to find its way through the urethra, and that quantity will daily increase, and, in quite as short a time as can be expected, the wound will be perfectly healed.

STONE IN THE URETHRA.

On account of the length, and narrowness, and curvature of the urethra in the ox, obstruction of that passage by a calculus is a circumstance of too frequent occurrence. The symptom which would lead to a suspicion of this would be, in addition to the evidence of considerable pain, and general irritation, a complete, or almost complete, suppression of urine. The practitioner should examine the urethra through the whole of its course anterior to the inverted *S* curve; the calculus will then be felt, or probably the protuberance caused by its presence will be immediately seen. The

* Veterinarian, April, 1834, p 201

duty of the surgeon is now, in most cases, easily and quickly performed. An *oblique* incision must be made upon the calculus, sufficiently long to enable it to be taken out. By means of the *oblique* incision, the calculus and the urethra are less likely to roll under the knife, and the wound will more readily heal. One or two sutures should be passed through the edges of the wound, which will speedily adhere. The operation is simple, but the danger of neglect is great; and many a beast has been lost by the bladder being distended, and continuing so until violent inflammation of its mucous coat has taken place, or it has been ruptured.

Should not the calculus be in this anterior portion of the urethra, that between the scrotum and the anus should be carefully examined; and if it is not found there, it is imprisoned somewhere in the inverted S curve. An incision must then be made anteriorly to the scrotum, in the manner already described; the penis drawn out; the curve for a while obliterated; the situation of the obstruction discovered; the urethra laid open at that point; and the calculus extracted.

M. Peyron relates a singular case of calculus in the urethra. He was sent for in great haste to an ox that was evidently in great pain. The animal was continually getting up and lying down, and straining to void his urine, but only a few drops appeared. On looking attentively at the course of the urethra, while a tapping motion was made on the upper part of it, the fluctuation of some fluid could be perceived. From this, M. Peyron concluded that the passage through the urethra was obstructed. He cut into the canal at the place where it proceeded from the ischium, and the urine immediately gushed out. He did not push the operation further, persuaded that after he had been so fortunate as to extract the calculus, *another would soon descend from the bladder and form a fresh obstruction*. The beast was kept during a month, and then sold advantageously, having fully retained its condition, but the urine had continued to flow from the wound during the whole time.* The reasoning of M. Peyron would not have satisfied most practitioners, but they would have endeavoured to ascertain the precise situation of the calculus, and extracted it, undeterred by the fear of that which might never have happened: the case, however, shows that no material mischief will be done, even if the wound should not readily heal. †

Some veterinarians have remarked, that oxen are most subject to the formation of these calculi during the autumn and winter; and that, as the spring advances, the new grass produces a more abundant secretion of urine, and thus relaxes the urinary organs, and enables the calculi more easily to pass; while the fresh herbage gives an alkaline and soapy character to the urine, which causes some of the recently formed calculi to be dissolved in the bladder.

RUPTURE OF THE BLADDER.

This is the necessary consequence of over-distension of a vessel the coats of which are naturally weak; or it may be produced by a careless or brutal mode of casting the animal. It would not require any great shock in

* Journal Pratique, 1827, p. 333.

† An interesting account of the operation of lithotomy on the horse will be found in Perceval's Lectures, vol. iii. p. 45; another by Mr. Sewell, Assistant Professor at the Royal Veterinary College, in the "Veterinarian" for May, 1829, p. 172; and a third, and the most detailed and satisfactory, by Mr. Taylor, of Nottingham, in the "Veterinarian," for April, 1834, p. 201. The operation of DILATATION, which Mr. Perceval ("Lectures," vol. iii. p. 47,) describes as singularly applicable in veterinary practice, not only in the female but in the male subject, could not possibly succeed in the ox.

order to rupture the bladder, after suppression of urine had existed several days, and the coats of the bladder had begun to be weakened by inflammation.

M. Peyron examined a beast that had laboured under suppression of urine eight days: he was slaughtered, and the bladder was found to be ruptured. No mention is made of any effect produced by the urine in the abdominal cavity, either as exciting peritoneal inflammation or discolouring the flesh; it is, therefore, probable that the rupture had taken place a little while only before death, and perhaps in the act of falling. In another case, the perfect depression of the animal, the feeble and slow pulse, and the staggering walk, coupled with a long suppression of urine, excited a suspicion that rupture of the bladder had already taken place; and on examination after death, the whole of the abdominal cavity was so discoloured by the urine that the meat could not be used.

The circumstances which would most unerringly indicate a rupture of the bladder would be the impossibility of detecting that vessel in the pelvic cavity when the hand was introduced into the rectum; or, after the bladder had been felt, round and hard almost as a foot-ball, and the animal had been expressing in every possible way the torture he endured, a perfect calm all at once succeeding. This would probably be hailed by the inexperienced practitioner as a symptom of recovery, but the skilful one would regard it as the forerunner of death. If a day or two had passed since the rupture of the bladder, the experienced eye would detect it by a certain engorgement of the limbs, and particularly of the hind limbs; and there would often be an evident urinous smell about the animal even before it was dead. In such case, the bladder is commonly found in a state of gangrene; the intestines are highly inflamed, and the whole of the meat is discoloured and nauseous. It is, therefore, of consequence to ascertain the state of these parts during the life of the animal, either that an operation may be attempted, or that the farmer may sell him, while there is any thing about him that is saleable beside his skin. In fine, when it is recollected that the existence of these calculi betrays a constitutional tendency to their formation, and that the removal of one may at no great length of time be followed by the appearance of another; when, from the length and narrowness, and, more especially, from the singular curvature of the urethra in the ox, it is in a manner impossible for calculi half so large to pass as those that easily traverse this canal in the horse; and that the walls of the bladder in the ox are so weak compared with those of the horse, it will become a matter for consideration, whether the beast, in good saleable condition, should not be destroyed as soon as this obstruction is clearly ascertained: and, most certainly, the animal that has been successfully operated upon for suppression of urine, and that is not then fit for the market, should be fattened, and got rid of as quickly as possible.

The cow is in a manner exempt from these sad accidents, because the calculi readily find their way through her short, and capacious, and straight urethra.

INVERSION OF THE BLADDER.

This has occasionally taken place in the violent throes of parturition. The efforts of the practitioner must then be confined to the preservation of the calf, for the bladder can never be returned to its natural situation: and although the mother might possibly survive the removal of this vessel, yet as the urine must continue to be secreted, and to be got rid of, and, trickling down her legs, would produce constant soreness and ulceration, she would ever be a nuisance to herself, and a disgusting object to those who had the care of her.

The following case, which happened to a skilful practitioner, may perhaps be a warning to others: A cow had been three days in the act of calving, and little advance had been made. She was lying on her right side exhausted, but occasionally lowing mournfully, and making violent efforts to expel the fœtus. A round, fibrous, white tumour presented itself—it was evidently distended by some fluid, for the fluctuation was detected at the slightest touch. Not dreaming that it could be any thing beside the membranous bag which contained the natural uterine fluid, he punctured it, and he was astonished when that which ran out had the colour and smell of urine. It was the bladder which had protruded through a rent in the vagina, and which he might have recognised by its smaller bulk, its firmer texture, and by the ease with which the neck would have been discovered after a very slight examination. The calf was saved—the mother might, probably, have been saved too—the internal laceration might have been healed, and the practitioner would have escaped the consciousness of having made a somewhat disgraceful blunder.

CHAPTER XVI.

BREEDING.—PARTURITION.

THE characteristics of the different breeds of British cattle, the peculiar excellencies and the peculiar defects of each, and their comparative value, as adapted to different climates and soil and pasture, have been already considered: a few remarks on *the principles* of breeding were reserved for this chapter.

That which lies at the foundation of the improvement of every stock, or the successful management of it, is the fact,—the common, but too much neglected axiom, that “*like produces like.*” This is the governing law in every portion of animated nature. There is not a deviation from it in the vegetable world, and the exceptions are few and far between among the lower classes of animals. When in the higher species the principle may not seem at all times to hold good, it is because another power, the intellectual—the imaginative—somewhat controls the mere organic one; or, in a great many instances, the organic principle is still in full activity, for the lost resemblance to generations gone by is pleasingly and strongly revived. The principle that “*like produces like,**” was that which gave birth to the valuable, but too short-lived, new Leicester breed; it was the principle to which England is indebted for the short-horns, that are

* “The simple observation, that domestic animals possess a tendency to produce animals of a quality similar to their own, was the ground-work of all Bakewell’s proceedings. It was equally obvious to others as to him, but by him first applied to the useful purpose to which it has since been rendered subservient. Having made this observation, he inferred, that by bringing together males and females possessing the same valuable properties, he should insure their presence in their offspring, probably in an increased degree, they being inherited from both parents; and he concluded, that by persisting in breeding from animals the produce of such selections, always keeping in sight the properties that constituted their value, he should at length establish a breed of cattle of which those properties would form the distinguishing and necessary characteristic. By this process it was that in his time, with respect to his long-horns, and subsequently with regard to other breeds of cattle, the term *blood* came to be distinctively applied. When reference could be made to a number of ancestors of distinguished excellence, the term *blood* was admitted.”—The Rev. H. Berry’s admirable Prize Essay on Breeding.

now establishing their superiority in every district of the kingdom. Every cow and heifer of the SHAKSPEARE blood could be recognized at first sight as having descended from Mr. Fowler's stock; and the admirer of the short-horns can trace in the best cattle of the present day the undoubted lineaments of FAVOURITE.

This principle extends to form, constitution, qualities, predisposition to, and exemption from disease, and to every thing that can render an animal valuable or worthless. It equally applies to the dam and to the sire. It is the foundation of scientific and successful breeding*.

Let it be supposed, that the cattle of a certain farmer have some excellent qualities about them; but there is a defect which considerably deteriorates from their value, and which he is anxious to remove. He remembers that "like produces like," and he looks about for a bull that possesses the excellence which he wishes to engraft on his own breed. He tries the experiment, and, to his astonishment, it is a perfect failure. His stock, so far from improving, have deteriorated.

The cause of this every-day occurrence was, that he did not fairly estimate the extent of the principle from which he expected so much. This new bull had the good point that was wanting in his old stock; but he too was deficient somewhere else, and, therefore, although his cattle had in some degree improved by him in one way, that was more than counterbalanced by the inheritance of his defects. Here is the secret of every failure—the grand principle of breeding. The new-comer, while he possesses that which was a desideratum in the old stock, should likewise possess every good quality that they had previously exhibited—then, and then alone, will there be improvement without alloy. What can a farmer expect if he sends a worthless cow to the best-bred bull—or, on the other hand, if his cows, although they may have many good qualities, are served by a bull that perhaps he has scarcely seen, or whose points he has not studied, and whose only recommendations are, that he is close at hand and may be had for little money?

The question as to the comparative influence of the sire and the dam is a difficult one to decide. That farmer will not err, who applies the grand principle of breeding equally to both of them. In the present system of breeding, most importance, and that very justly, is attributed to the male. He is the more valuable animal, and principally more valuable on account of the more numerous progeny that is to proceed from him, and thus his greater general influence; and therefore superior care is bestowed on the first selection of him for rearing. The farmer studies the bull-calf closely, and assures himself that he possesses, in a more than usual degree, the characteristic excellencies of the breed. When this care as to the possession of such combination of good points has extended from the sire to the son through several successive generations, it may be readily supposed that he will possess them in a higher degree than the female can. They

* There are a few strange exceptions to this, showing the power of imagination even over so dull a beast as the cow. Her progeny is often much affected by circumstances that happen during the time of conception, or rather during the period she is in season. Mr. Boswell says, "One of the most intelligent breeders I ever met with in Scotland, Mr. Mustard, of Angus, told me a singular fact with regard to what I have now stated. One of his cows chanced to come in season, while pasturing on a field, which was bounded by that of one of his neighbours, out of which an ox jumped, and went with the cow, until she was brought home to the bull. The ox was white, with black spots, and horned. Mr. Mustard had not a horned beast in his possession, nor one with any white on it. Nevertheless, the produce of the following spring was a black and white calf with horns.—Quarterly Journal of Agriculture, vol. i. Essays, p. 28.

will be made, as it were, a part and portion of his constitution, and he will acquire the power of more certainly, and to a greater extent, communicating them to his offspring.

In this way the influence of the sire may, in well-bred animals, be considered as superior to that of the female, but hers is always great, and must not be forgotten. In Arabia, where the mare is the object of chief attention, and her good qualities are carefully studied and systematically bred in her, the influence of the female decidedly preponderates; and, on the same principle, that of the highly bred cow will preponderate over that of the half-bred bull. Her excellencies are an hereditary and essential part of her, and more likely to be communicated to her offspring than those which have been only lately and accidentally acquired by the bull with no pedigree, or with many a blot in it. Custom and convenience, however, induce the generality of breeders to look most to the male.*

At the outset of his career, the farmer should have a clear and determined conception of the object that he wishes to accomplish. He should consider the nature of his farm; its abundance or deficiency of pasturage; the character of the soil; the seasons of the year when he will have plenty or deficiency of food; the locality of his farm; the market to which he has access, and the produce which will there be disposed of with greatest profit, and these things will at once point to him the kind of beast which he should be solicitous to obtain. The man of wealth and patriotism may have more extensive views, and nobly look to the general improvement of British cattle; but the farmer, with his limited means, and with the claims that press upon him, regards his cattle as a valuable portion of his own little property, and on which every thing should appear to be in natural keeping, and be turned to the best advantage.

The best beast for him is that which suits his farm the best; and, with a view to this, he studies, or ought to study, the points and qualities of his own cattle, and those of his neighbours. The dairy-man will regard the quantity of milk—the quality—the time that the cow continues in milk—its value for the production of butter or cheese—the character of the breed for quietness—or as being good nurses—the predisposition to red-water, garget, or dropping after calving—the natural tendency to turn every thing to nutriment—the easiness with which she is fattened, when given up as a milker, and the proportion of food requisite to keep her in full milk, or to fatten her when dry. The grazier will consider the kind of beast which his land will bear—the kind of meat most in demand in his neighbourhood—the early maturity—the quickness of fattening at any age—the quality of the meat—the parts on which the flesh and fat are principally laid—and, more than all, the hardihood and the adaptation of constitution to the climate and soil.

In order to obtain these valuable properties, the farmer will make himself perfectly master of the character and qualities of his own stock. He will trace the connexion of certain good qualities and certain bad ones, with an almost invariable peculiarity of shape and structure; and at length he will arrive at a clear conception, not so much of beauty of form (al-

* Mr. Adam Ferguson, of Woodhill, to whom the Highland Society of Scotland, and the Scottish agriculturists generally, are so much indebted, has an amusing anecdote on this point. "I recollect, several years ago, at a distinguished breeder's in Northumberland, meeting with a shrewd Scottish borderer, (indeed, if report be true, the original and identical Dinmont,) who, after admiring with a considerable spice of national pique, a very short-horned bull, demanded anxiously to see the dam. The cow being accordingly produced, and, having undergone a regular survey, Dandy vociferated, with characteristic *pith*, "I think naething of your bull now, wi' sic a caumb."—Quarterly Journal of Agriculture, vol. i. p. 34.

though that is a pleasing object to contemplate) as of that outline and proportion of parts with which *utility* is oftenest combined. Then carefully viewing his stock, he will consider where they approach to, and how far they wander from, this utility of form; and he will be anxious to preserve or to increase the one, and to supply the deficiency of the other.* He will endeavour to select from his own stock those animals that excel in the most valuable points, and particularly those which possess the greatest number of these points; and he will unhesitatingly condemn every beast that betrays manifest deficiency in any one important point. He will not, however, too long confine himself to his own stock, unless it is a very numerous one. The breeding from close affinities—the breeding *in and in*—has many advantages to a certain extent. It may be pursued until the excellent form and quality of the breed is developed and established. It was the source whence sprung the cattle and the sheep of Bakewell, and the superior cattle of Colling; and to it must also be traced the speedy degeneracy—the absolute disappearance of the new Leicester cattle, and, in the hands of many an agriculturist, the impairment of constitution and decreased value of the new Leicester sheep and the short-horned beasts. It has, therefore, become a kind of principle with the agriculturist to effect some change in his stock every second or third year, and that change is most conveniently effected by introducing a new bull. This bull should be, as nearly as possible, of the same sort; coming from a similar pasturage and climate; but possessing no relationship—or, at most, a very distant one—to the stock to which he is introduced. He should bring with him every good point which the breeder has laboured hard to produce in his stock, and, if possible, some improvement, and especially where the old stock may have been somewhat deficient; and most certainly he should have no manifest defect of form; and that most essential of all qualifications, a hardy constitution, should not be wanting.

There is one circumstance, however, which the breeder occasionally forgets, but which is of as much importance to the permanent value of his stock as any careful selection of animals can be—and that is, good keep. It was judiciously remarked by the author of the “Agricultural Report of Staffordshire,” that “all good stock must be both bred with attention and well fed. It is necessary that these two essentials in this species of improvement should always accompany each other; for without good resources of keeping, it would be vain to attempt supporting a capital stock.” This is true with regard to the original stock; it is yet more evident when animals are absurdly brought from a better to a poorer soil. The original stock

* “Upon the principle that ‘like produces like,’ he (Bakewell) started, and the advantages which crowned his exertions may be thus stated: an increased perfection of general symmetry, by which is to be understood not only a form attractive to the eye of taste, but one in which the judgment acknowledged a considerable preponderance of the valuable parts of the carcase over those of less value; an increased tendency to lay on flesh of a superior quality under all circumstances of feeding, and, of course, a superior article for the use of the consumer, produced by a decreased consumption of vegetable or other food.

“A person would often be puzzled: he would find different individuals possessing different perfections in different degrees—one, good flesh, and a tendency to fatten, with a bad form—another, with fine form, but bad flesh, and little disposition to acquire fat:—what rule should he lay down, by the observance of which good might be generally produced, and as little evil as possible effected?—*UTILITY*. The truly good form is that which secures constitution, health, and vigour—a disposition to lay on flesh, and with the greatest possible reduction of offal. Having obtained this, other things are of minor, although perhaps of considerable, importance.”—The Rev. H. Berry’s Prize Essay

will deteriorate if neglected and half-starved; and the improved breed will lose ground even more rapidly, and to a far greater extent.

The full consideration, however, of the subject of breeding belongs to the work on "British Husbandry," and there full justice will be done to it: but the few hints that have here been dropped with reference to the fundamental principles on which the improvement of cattle must be founded will not, perhaps, be deemed irrelevant.*

THE PROPER AGE FOR BREEDING.

The proper age at which the process of breeding may be commenced will depend on various circumstances. Even with the early maturity of the short-horns, if the heifers could be suffered to run until they were two and a half, or three years old, they would become larger, finer, and more valuable; and their progeny would be larger and stronger: but the expense of the keep for so long a time is a question that must be taken into serious consideration. The custom which at one period was beginning to be so prevalent in the breeding districts, of putting the heifer to the male at one year old, or even at an earlier period, cannot be too much reprobated. At the time when they are most rapidly growing themselves, a sufficient quantity of nutriment cannot be devoted to the full development of the foetus, and both the mother and the calf must inevitably suffer.

From two, to two-and-a-half years old, according to the quality of the pasture, will be the most advantageous time for putting the heifer to the bull. In fair pasture, the heifer will probably have attained sufficient growth at two years. If the period is prolonged after three years, and especially with good keep, the animal will often be in too high condition, and there will be much uncertainty as to her becoming pregnant.† At an

* The following extract from "the Rev. H. Berry's Prize Essay" contains the sum and substance of the principles of breeding:—

"A person selecting a stock from which to breed, notwithstanding he has set up for himself a standard of perfection, will obtain them with qualifications of different descriptions, and in different degrees. In breeding from such he will exercise his judgment, and decide what are indispensable or desirable qualities, and will cross with animals with a view to establish them. His proceeding will be of the 'give and take' kind. He will submit to the introduction of a trifling defect, in order that he may profit by a great excellence; and between excellencies, perhaps somewhat incompatible, he will decide on which is the greatest, and give it the preference.

"To a person commencing improvement, the best advice is to get as good a *bull* as he can; and if he be a good one of his kind, to use him indiscriminately with all his cows; and when by this proceeding, which ought to be persisted in, his stock has, with an occasional change of bull, become sufficiently stamped with desirable excellencies, his selection of males should then be made, to eradicate defects which he thinks it desirable to get rid of.

"He will not fail to keep in view the necessity of *good blood* in the bulls resorted to, for that will give the only *assurance* that they will transmit their own valuable properties to their offspring; but he must not depend on this alone, or he will soon run the risk of degeneracy.

"In animals evincing an extraordinary degree of perfection, and where the constitution is decidedly good, and there is no prominent defect, a little close breeding may be allowed—as the son with the mother, to whom he is only half-blood—or the brother with the sister. But this must not be injudiciously adopted or carried too far, for although it may increase and confirm valuable properties, it will also increase and confirm defects; and no breeder need be long in discovering that in an improved state animals have a greater tendency to defect than to perfection. Close breeding, from affinities, impairs the constitution, and affects the procreative powers, and therefore a strong cross is occasionally necessary."

† When heifers of this age will not stand their bulling, a couple of doses of physic, or the turning on shorter pasture until they next come into season, will set all right.

Mr. Parkinson's opinion, although somewhat different in one point from that we have stated, deserves consideration:—"I had three heifers, when I lived at Slane,

early age there will often be danger in calving from the heifer not having attained her proper size; and another, that has her first calf too late, will be in danger from fever

It will be evident from this that the bull should not be suffered to run with the young stock; and although it is said that cows are quieter, and thrive better, and are more readily and surely impregnated as they come in season when they have the bull with them in the pasture, yet it is becoming more the practice, and often very advantageously so, to separate him from them altogether. By watching the cows as they come into season, and keeping them back when the time of parturition would be inconvenient, the farmer will be enabled to get them to calve at the periods that best suit his pasture or his arrangements. The calves may be dropped at the beginning of the year, when veal and butter will yield the greatest profit; or later in the season, when the spring grass is preparing to come in, and when the young animal will thrive better, and a greater secretion of milk, and the habit of yielding it at every subsequent calving, will be established in the mother.*

That which has been said of the best age for beginning to breed in the cow will equally apply to the bull. It is absurd and dangerous to begin to use him as some have done when a yearling. He will come into season at two years old—he will be better at three; and although the farmer may not deem it prudent to keep him more than two or three years, he may then be sold advantageously, in his full prime, to another breeder.

ABORTION, OR SLINKING.

The usual period of pregnancy in a cow is nine calendar months, or 270 days; but there is often considerable variation in the time of what seems to be a natural delivery, and when the calf is likely to live.†

The cow, however, is more than any other animal subject to abortion. This takes place at different periods of pregnancy, from half of the usual time to the seventh, or almost the eighth month. The symptoms of the approach of abortion, except the breeder is very much among his stock, are not often perceived; or if perceived, they are concealed by the cowherd, lest he should be accused of neglect or improper treatment.

took the bull at one year old, I believe, in consequence of their being reared in the open air at the haystacks, which caused them to be forwarder. I had not the least idea of this happening, or I should have prevented it, as I think it very injudicious. It is the opinion of some persons, that by suffering heifers to be three or four years old they make fine cattle, but I never found any material difference; while there is a loss of one year, besides the danger of not standing the bulling; and it adds very much to the profit of the heifer if she be given to the bull at two or two-and-a-half years old, for the time she is in calf, added to that of the calf sucking and the time she will be fattening, bring her to four or four years and a half when she is slaughtered. A heifer that has had a calf will fatten quicker and tallow better than one of the same age that has not, while a calf is gained, worth, if of a good breed, eight or ten pounds as a store beast."—*Treatise on Live Stock*, vol. i. p. 99.

* Most of the various recipes to bring a cow into season are absurd and dangerous. One given by Mr. Parkinson is the simplest, the most harmless, and the most successful too:—"Give a quart or more of milk, immediately drawn from a cow that is in season, before the bull has been admitted to her, and in three or four days it will have the desired effect."—*Treatise on Live Stock*, vol. i. p. 101.

The repeated return of the period of heat during the spring and summer months will, if the farmer keeps his bull apart from the cows, enable him to arrange the periods of parturition almost at his pleasure.

† M. Tessier, in a Memoir read to the Royal Academy of Sciences at Paris, says, that in 1131 cows, which he had the opportunity of observing, the shortest period of gestation was 240 days, and the longest 321—difference 81 days; and counting from nine months, 51 days over and 30 days under.

The cow is somewhat off her feed—rumination ceases—she is listless and dull—the milk diminishes or dries up—the motions of the fœtus become more feeble, and at length cease altogether—there is a slight degree of enlargement of the belly—there is a little staggering in her walk—when she is down she lies longer than usual, and when she gets up she stands for a longer time motionless. As the abortion approaches, a yellow or red glairy fluid runs from the vagina (this is a symptom which rarely or never deceives)—her breathing becomes laborious and slightly convulsive. The belly has for several days lost its natural rotundity, and has been evidently falling—she begins to moan—the pulse becomes small, wiry, and intermittent. At length labour comes on, and is often attended with much difficulty and danger.

If the abortion has been caused by blows or violence, whether arising from the brutality of the cowherd, or the animal being teased by other cows in season, or by unskillfully castrated oxen, the symptoms are more intense. The animal suddenly ceases to eat and to ruminate—she is uneasy, paws the ground, rests her head on the manger while she is standing, and on her flank when she is lying down—hemorrhage frequently comes on from the uterus, or when this is not the case, the mouth of the uterus is spasmodically contracted. The throes come on, they are distressingly violent, and they continue until the womb is ruptured. Should not all these circumstances be observed, yet the labour is protracted and dangerous.

Abortion is sometimes singularly frequent in particular districts, or on particular farms. It seems to assume an epizootic or epidemic form. This has been accounted for in various ways. Some have imagined it to be contagious. It is destructively propagated among the cows, but this is probably to be explained on a different principle than that of contagion. It has been stated that the cow is an animal considerably imaginative, and highly irritable during the period of pregnancy. In abortion the fœtus is often putrid before it is discharged; and the placenta, or afterbirth, rarely or never immediately follows it, but becomes decomposed, and, as it drops away in fragments, emits a peculiar and most noisome smell. This smell seems to be singularly annoying to the other cows—they sniff at it, and then run bellowing about. Some sympathetic influence is produced on their uterine organs, and in a few days a greater or less number of those that had pastured together likewise abort. Hence arises the rapidity with which the fœtus is usually taken away and buried deeply, and far from the cows; and hence the more effectual preventive of smearing the parts of the cow with tar or stinking oils, in order to conceal or subdue the smell; and hence, too, the ineffectual preventive of removing her to a far distant pasture.

Chabert, in his "Veterinary Instructions," relates a singular case of this—a kind of pest or plague in the dairy of a farmer at Toury. For thirty years his cows had been subject to abortion. His cowhouse was large and airy; his cows were apparently in good health; they were fed like others in the village; they drank from the same pond; there was nothing different in the pasture; his servants were not accustomed to ill-use the cattle, and he had changed these servants many times in the thirty years. He had changed his bull many a time—he had pulled down his cowhouse, and he had built another in a different situation, with a different aspect, and on a different plan; he had even (agreeably to the superstition of the neighbourhood) taken away the aborted calf through the window, that the curse of future abortion might not be entailed on the cow that passed over the same threshold; nay, to make all sure, he had broken through the wall at the end of the cowhouse, and opened a new door, in

order that there might not be the possibility that an elf-struck foetus had previously gone that way; but still a greater or less number of his cows every year slunk their calves.

Thirty years before he had bought a cow at a fair, and she had warped, and others had speedily followed her example; and the cow that had once slunk her calf was liable to do the same in the following year, and so the destructive habit had been perpetuated among his beasts.

Several of the cows had died in the act of abortion, and he had replaced them by others; more of those that had aborted once or twice, or oftener, had been sold, and the vacancies filled up. M. Chabert advised him to make a thorough change. This had never occurred to the farmer, but he at once saw the propriety of the counsel. He sold every beast, and the plague was stayed*. This sympathetic influence is one main cause of the slinking of the calves. There is no contagion, but the result is as fatal as the direst contagion could have made it.

Another cause of abortion is the extravagantly high condition in which cows are sometimes kept. They are in a continual state of excitement; and from the slightest cause inflammation is set up in the uterus, rendered more susceptible by the state of pregnancy, and abortion is the frequent consequence of that inflammation.

M. Cruzel has given an instructive account of abortion thus produced. He was consulted by a farmer who had ten breeding cows, that occasionally worked at the plough, as is often the case in France. During the first year three of them aborted. They recovered, and were soon again in calf. Two of them slunk their calves a second time, between the fifth and sixth month of pregnancy; the third went her full time, and produced a weakly calf that died on the second day. In the following year a fourth aborted, and M. Cruzel was sent for. He was immediately struck with the unnecessary high condition in which all the cows and their calves were: he carefully inquired, but could discover no other probable cause for these repeated accidents, and he at once attributed them to the state of plethora in which the beasts were kept. He ordered their quantity of food to be materially reduced—he bled every one of them—the farmer took care that nutriment should not afterwards be so dangerously wasted upon them, and abortion ceased to appear on the farm†.

Mr. Wedge, in his "Survey of Cheshire," confirms this. He says that "slinking happens generally in wet seasons, or *when the cattle are in very high condition*, and generally continues for two or three years together. In several parts of North Wales, where the cattle through necessity are kept in lower condition, instances of the kind very rarely happen."

The pastures on which the blood or inflammatory fever is most prevalent are those on which the cows oftenest slink their calves. Whatever can become a source of general excitation and fever is likely, during pregnancy, to produce inflammation of the womb; or whatever would, under other circumstances, excite inflammation of almost any organ, has at that time its injurious effect determined to this particular one.

There are some curious illustrations of this. It is well known that cattle of all kinds are sometimes seriously injured by feeding in the autumn on grass thickly covered with hoar-frost. Inflammation of the bowels of a dangerous character, and sometimes palsy of the rumen, have been thus produced. In Switzerland, the commencement of the hoar-frost is the signal for the appearance of abortion. It is occasionally seen at other times in all the cantons, but now its victims are multiplied tenfold. M. Barruel, V. S.

* Instructions Vétérinaires, tom. vi. p. 117.

† Journ. Théor. et Prat., 1832, p. 157.

of Chartres, speaks of sixteen cows that aborted at different periods of pregnancy from this cause, and most of whom died *.

It has been stated (page 505) that acrid plants are often prejudicial to cattle. "There is no farmer who is not aware of the injurious effect of the coarse, rank herbage of low, marshy, and woody countries, and he regards these districts as the chosen residence of red-water;" it may be added, that these districts are also the chosen residence of abortion.

Hard and mineral waters are justly considered as laying the foundation for many diseases in cattle, and for this among the rest. A writer in a German periodical gives the following account:—"In 1822 twelve of his in-calf heifers cast their calves, and in the following year the like accident happened to twelve others, the whole of which used to drink from ponds the water of which was strongly impregnated with iron. In 1824 ten cows that were watered at other places all calved safely, while a single cow that was allowed to drink of the ferruginous water cast her calf. The same occurred in two following years †."

Some careful observers have occasionally attributed abortion to the disproportion in size between the male and female. Farmers used to be too fond of looking out for a great overgrown bull for their dairy or breeding cows, and many a heifer or little cow was seriously injured: she either cast her calf or was lost in parturition. This error has been long exploded among the breeders of sheep; and breeders of cattle are beginning to act more wisely ‡.

Cows that have been long afflicted with hoose, and that degenerating into consumption, are exceedingly subject to abortion. They are continually at heat—they rarely become pregnant, or if they do, a great proportion of them cast their calves. When consumption is established, and the cow is much wasted away, she will rarely retain her calf during the natural period of pregnancy.

An in-calf beast will scarcely have hoove to any considerable extent without afterwards aborting. The pressure of the distended rumen seems to injure or destroy the fœtus. Even where the distention of the stomach does not wear a serious character, abortion often follows the sudden change from poor to luxuriant food. Cows that have been out and half-starved in the winter, and incautiously turned on rich pasture in the spring, are too apt to cast their calves from the undue general or local excitation that is set up; and, as has been already remarked, a sudden change from rich pasture to a state of comparative starvation will produce the same effect, but from an opposite cause. Hence it is that when this disposition to abort first appears in a dairy, it is usually in a cow that has been lately purchased. Fright, from whatever cause, may produce abortion. There are singular cases on record of whole herds of cows slinking their calves after being terrified by an unusually violent thunder-storm §. Commerce with the bull soon after conception is a frequent cause of abortion. The casting of the calf has already been attributed to the sympathetic influence

* Journ. Théor. et Prat., 1832, p. 154.

† Landund Hauswirth, March, 1827, p. 132.

‡ Mr. Wedge, in his "Survey of Cheshire," says that a whole dairy of nearly twenty cows cast their calves in one year. The farmer sold the bull he had used to a neighbour, and the whole number of cows to which he was put cast their calves also. The original owner took back the bull, and three of his cows were again put to him, and they also cast their calves. In this instance there was clearly some defect in the male.

§ Instructions Vétérinaires, vol. vi. p. 154. Dr. Rudge, in his "Survey of Gloucestershire," says, that there was an enclosure near Arlingham, close to which was a dog-kennel. Eight heifers and cows out of twenty warped, in consequence, as it was supposed by the farmer, of the frequent exposure of flesh, and the skinning of dead horses so near them. The remainder were removed to a distant pasture and did well.

of the effluvia from the decomposing placenta: there are plenty of instances in which other putrid smells have produced the same effect, and therefore the inmates of crowded cowhouses are not unfrequently subject to this mishap.

Besides these tangible causes of abortion, there is the mysterious agency of the atmosphere. There are certain seasons when abortion is strangely frequent and fatal; while at other times it in a manner disappears for several successive years. In the "Leipsic Agricultural Gazette," March 22, 1777, it is stated, that, "by an unheard-of fatality, the abortion of cows in that district was almost general, and that after the most anxious research, no assignable cause for it could be discovered, nor would any medicine or medical treatment arrest the plague."

In 1789, all the cows in Beaulieu aborted. This, however, was traced to the long continuance of wet weather*.

In 1782 the cows near Granvilliers slinked their young, and this was attributed to the excessive heat of the preceding summer. In 1784 almost all the cows and mares at Châlons aborted, and the cause was unknown†. In 1787 all the cows at Bournonville cast their calves. They had not been out of the cowhouse during the whole of the winter, and had been well taken care of‡. There is no doubt that this must be added to the number of epidemic diseases.

The consequences of premature calving are frequently of a very serious nature. It has been stated that there is often considerable spasmodic closure of the mouth of the uterus, and that the calf is produced with much difficulty and pain, and especially if a few days have elapsed after the death of the young one. When this is the case the mother frequently dies, or her recovery is much slower than after natural parturition. The coat continues rough and staring for a long time—the skin clings to the ribs—the appetite does not return, and the milk is dried up. Some internal chronic complaint now takes its rise, and the foundation is laid for consumption and death.

When the case is more favourable, the results are, nevertheless, often annoying. The cow very soon goes again to heat, but in a great many cases she fails to become pregnant; she almost certainly does so if she is put to the bull during the first heat after abortion. The heat again and again returns, but she does not stand to the bulling; and so the season is wasted, while she becomes a perfect nuisance by continually worrying the other cattle§.

If she should come in calf again during that season, it is very probable that about the same period of utero-gestation, or a little later, she will again abort; or that when she becomes in calf in the following year, the same fatality will attend her. Some say that this disposition to cast her young one gradually ceases; that if she does miscarry, it is at a later and still later period of pregnancy; and that, in about three or four years, she may

* Instructions Vétérinaires, tom. vi. p. 137. † Ibid. pp. 130, 131.

‡ Somewhat analogous is an account given by White, in his most interesting and instructive work, the "Natural History of Selborne." Dr. Johnson says, that in 1771 the season was so severe in the Isle of Skye, that it is remembered by the name of the *black spring*. The snow, which seldom lies at all, covered the ground for eight weeks; many cattle died, and those that survived were so emaciated that they did not require the male at the usual season. The case was just the same with us here in the South. Never were so many barren cows known as in the spring following that dreadful period: whole dairies missed being in calf together.—P. 396.

§ The French have a very expressive name for these cows: they call them *taureilles*. A kind of nymphomania is produced, under the influence of which the cow frequently wastes away and becomes a perfect skeleton.

be depended upon as a tolerably safe breeder: he, however, would be exceedingly inattentive to his interest who kept a profitless beast so long.

The calf very rarely lives, and in the majority of cases it is born dead or putrid. If there should appear to be any chance of saving it, it should be washed with warm water, carefully dried, and fed frequently with small quantities of new milk, mixed, according to the apparent weakness of the animal, either with raw eggs or good gruel; while the bowels should, if occasion requires, be opened by means of small doses of castor oil. If any considerable period has to elapse before the natural term of pregnancy would have expired, it will usually be necessary to bring up the little animal entirely by the hand.

The treatment of abortion will differ little from that of parturition, presently to be described. If the farmer has once been tormented by this pest in his dairy, he should carefully watch the approaching symptoms of casting the calf, and as soon as he perceives them, should remove the cow from the pasture to a comfortable cowhouse or shed. If the discharge is glairy, but not offensive, he may hope that the calf is not dead: he will be assured of this by the motion of the fœtus, and then it is possible that the abortion may yet be avoided. He should hasten to bleed her, and that copiously, in proportion to her age, size, condition, and the state of excitation in which he may find her; and he should give a dose of physic immediately after the bleeding. The physic beginning to operate, he should administer half a drachm of opium and half an ounce of sweet spirit of nitre. Unless she is in a state of great debility, he should avoid above all things the *comfortable drink*, which some persons so strangely recommend, and which the cowleech will be almost sure to administer. He should allow nothing but gruel, and he should keep his patient as quiet as he can. By these means he may occasionally allay the general or local irritation that precedes or causes the abortion, and the cow may yet go to her full time.

Should, however, the discharge be fœtid, the natural conclusion will be that the fœtus is dead, and must be got rid of, and that as speedily as possible. Bleeding may even then be requisite, if much fever exists; or, perchance, the aforesaid comfortable drink may not be out of place. In other respects, the animal must be treated as if her usual time of pregnancy had been accomplished.

Much may be done in the way of *preventing* the formation of this habit of abortion among the cows. *The fœtus must be got rid of immediately.* It should be buried deep, and far from the cow-pasture. Proper means should be taken to hasten the expulsion of the placenta. A dose of physic should be given; the ergot of rye, as hereafter to be described, should be administered; the hand should be introduced, and an effort made, cautiously and gently, to detach the placenta: all violence, however, should be carefully avoided, for considerable and fatal hemorrhage may be speedily produced. The parts of the cow should be well washed with a solution of the chloride of lime, and this should be injected up the vagina, and also given internally. In the mean time, and especially after the expulsion of the placenta, the cowhouse should be well washed with the same solution, in the manner that was recommended when the treatment of the malignant epidemic was under consideration.

The cow, when beginning to recover, should be fattened and sold. This is the first and the grand step towards the prevention of abortion, and he is unwise who does not immediately adopt it. All other means are comparatively inefficient and worthless. It was the charm by means of which Chabert arrested the plague which for thirty successive years had devas-

tated the farm at 'Tourey. Should the owner be reluctant to part with her, two months at least should pass before she is permitted to return to her companions. Prudence would probably dictate that she should never return to them; but be kept, if possible, on some distant part of the farm.

Abortion having once occurred on the farm, the breeding cows should be carefully watched. Although well fed, they should not be suffered to get into too high condition. Unless they are decidedly poor and weak, they should be bled between the third and fourth months of pregnancy, and a mild dose of physic should be administered to each. If the pest continues to reappear, the owner should most carefully examine how far any of the causes of abortion that have been detected may exist on his farm, and exert himself in carefully removing them.

SYMPTOMS OF PREGNANCY.

The symptoms of pregnancy in its early stage used to be thought exceedingly unsatisfactory. The period of being in season (which generally lasts three or four days, and then ceases for a while, and returns in about three weeks or a month) might entirely pass over; and although it was then probable that conception had taken place, yet in a great many instances the hopes of the breeder were disappointed. It was not until between the third and fourth month, when the belly began to enlarge, or in many cases considerably later, and when the motions of the foetus might be seen, or at all events felt by pressing on the right flank, that the farmer could be assured that his cow was in calf. That greatest of improvements in veterinary practice, the application of the ear to the chest and belly of various animals (in order to detect, by the different sounds—which, after a short time, will be easily recognised—the state of the circulation through most of the internal organs, and consequently the precise seat and degree of inflammation and danger), has now enabled the breeder to ascertain the existence of pregnancy at as early a stage of it as six or eight weeks. The beating of the heart of the calf will be distinctly heard, twice, or more than twice as frequent as that of the mother; and each pulsation will betray the singular double beating of the foetal heart. This will also be accompanied by the audible rushing of the blood through the vessels of the placenta. The ear should be applied to the right flank, beginning on the superior part of it, and gradually shifted downwards and backwards. These sounds will soon be heard, and cannot be mistaken*.

TREATMENT BEFORE CALVING.

Little alteration needs to be made in the management of the cow for the first seven months of pregnancy; except that, as she has not only to yield milk for the profit of the farmer, but to nourish the foetus which is growing in

* The following is an extract from an "Essay on Auscultation, as the only unequivocal Evidence of Pregnancy," by Dr. J. C. Ferguson, Professor of Midwifery at King's College, London. The whole of the Essay is important even to the veterinary practitioner, and reflects the highest credit on the power of philosophical investigation and the truly philanthropic spirit of the writer:—"A goat had been procured for a very different purpose by Drs. Hunt, Corrigan, and myself, and bound on its back on the operating table. I casually applied the stethoscope to its abdomen, without the slightest previous knowledge of its pregnancy, and was surprised to detect almost immediately the distinct double pulsations of a foetal heart. My two friends, to whose accuracy of observation I have often been indebted, satisfied themselves perfectly of the fact; and on examining the uterus about an hour afterwards, we extracted a foetus, the heart of which did not exceed the size of a hazel nut. On inquiring of the person who sold us the goat, and on whose accuracy we could depend, we learnt that it was exactly seven weeks from copulation."—*Dublin Medical Transactions*, vol. i. part 1; New Series.

her womb, she should be well, yet not too luxuriantly fed. The half-starved cow will not adequately discharge this double duty, nor provide sufficient nutriment for the calf when it has dropped; while the cow in high condition will be dangerously disposed to inflammation and fever, when, at the time of parturition, she is otherwise so susceptible of the power of every stimulus. If the season and the convenience of the farmer will admit of it, she will be better at pasture, at least for some hours in the day, than altogether confined in the cowhouse.

At a somewhat uncertain period before she calves, there will be a new secretion of milk for the expected little one; and under the notion of somewhat recruiting her strength, in order better to enable her to discharge her new duty, but more from the uniform testimony of experience that there is danger of local inflammation and of general fever—garget in the udder, and puerperal fever, if the new milk descends while the old milk continues to flow, it has been usual to let the cow go *dry* for some period before parturition. Farmers and breeders have been strangely divided as to the length of this period. It must be decided by circumstances. A cow in good condition may be milked much longer than a poor one. Her abundance of food renders a period of respite almost unnecessary; and all that needs to be taken care of is that the old milk should be fairly gone before the new milk *springs*. In such a cow, while there is danger of inflammation from the sudden rush of the new milk into a bag already occupied, there is also considerable danger of indurations and tumours in the teats from the habit of secretion being too long suspended. The emaciated and overmilked beast, however, must rest a while before she can again advantageously discharge the duties of a mother.

Were the period of pregnancy of equal length at all times and in all cows, the one that has been well fed might be milked until within a fortnight or three weeks of parturition; while a holiday of two months should be granted to the poorer beast; but as there is much irregularity about this, it may be prudent to take a month or five weeks as the average period.

The process of parturition is one that is necessarily accompanied by a great deal of febrile excitement; and therefore, when it nearly approaches, not only should a little care be taken to lessen the quantity of food, and to remove that which is of a stimulating nature, but a mild dose of physic, and a bleeding regulated by the condition of the animal, will be very proper precautionary measures.

A moderately open state of the bowels is more necessary at the period of parturition in the cow than in the mare. During the whole time of pregnancy her enormous stomachs sufficiently press upon and confine the womb; and that pressure may be productive of injurious or fatal consequences, if at this period the rumen is suffered to be distended by unnutritious food, or the manny takes on that hardened state to which it is occasionally subject. Breeders have been sadly negligent here.

NATURAL LABOUR.

The springing of the udder, or the rapid enlargement of it from the renewed secretion of milk—the enlargement of the external parts of the bearing (the former, as it has been said by some, in old cows, and the latter in young ones)—the appearance of a glairy discharge from the bearing—the evident dropping of the belly, with the appearance of leanness and narrowness between the shape and the udder—a degree of uneasiness and fidgetiness—moaning occasionally—accelerated respiration—all these symptoms will announce that the time of calving is not far off. The cow should be brought near home, and put in some quiet, sheltered place.

In cold or stormy weather she should be housed. Her uneasiness will rapidly increase—she will be continually getting up and lying down—her tail will begin to be elevated, and the commencement of the labour-pains will soon be evident.

The natural progress of parturition should not be unnecessarily interfered with. The cow should be frequently looked at, but not disturbed. Although her pains may not be so strong as could be wished, she should not be too closely approached or examined until the water-bladder or bag containing the fluid in which the calf has hitherto floated has protruded and is broken. Soon afterwards it may be proper to ascertain whether the calf is "*coming the right way*." In the natural presentation of the fœtus, the calf may be considered as couching or lying on its belly; its fore-legs protruding into the passage, its head lying upon them, or being a little between them, and reaching down about as far as the knees, and the back of the calf corresponding with or opposed to the back of the mother.

While the throes continue tolerably strong, the farmer or practitioner should have patience, although the progress of the labour may be tediously slow. Nature will at length safely accomplish her object. But if the pains are evidently diminishing, and hour after hour has passed and the calf protrudes little or not at all more than it did, assistance should be rendered. A pint of sound ale, warmed, should be given in an equal quantity of gruel; warm gruel should be frequently administered, or at least put within the animal's reach; and access to cold water should be carefully prevented.

To the first pint of ale should be added a quarter of an ounce of the ergot of rye (spurred rye), finely powdered; and the same quantity of the ergot, with half a pint of ale, should be repeated every hour until the pains are reproduced in their former and natural strength, or the labour is terminated*.

MECHANICAL ASSISTANCE.

The power of medicine failing, recourse should be had to mechanical assistance. Twelve hours or more having elapsed from the commencement of the labour, this should be done, even although the calf may continue to be alive; and it should not be deferred one moment after it is ascertained that the fœtus is dead. Even now, however, the cow should not be disturbed more than is absolutely necessary; and it cannot be too deeply impressed on the mind of the farmer, that the frequent habit of rousing the poor animal, and driving her about, while she is in the act of calving, or even before the labour begins, is an unnatural, brutal, and dangerous one.

* There is some difference of opinion among practitioners as to the power of the spurred rye. Mr. Allinson, of Idle, says ("*Veterinarian*," Feb. 1834, p. 73)—"The ergot of rye has never yet failed in my practice to stimulate the uterus of cattle, whether the muscular power of that organ was exhausted by previous efforts, or torpid from peculiar temperament." On the other hand, Mr. Harrison, of Lancaster, ("*Veterinarian*," July, 1834, p. 360,) relates a case in which he gave it to the extent of more than a quarter of a pound without its producing the slightest effect.

The experience of the author of this work is undoubtedly in favour of the ergot. On the morning in which he writes this note, he witnessed its power in exciting the womb of a deer to very powerful action; but he must acknowledge that he has more than once, like Mr. Harrison, been disappointed in his expectations from it, which he is inclined to attribute to the peculiar formation of the stomachs of cattle which so often suspends the action of the most powerful purgative. He likewise adds his testimony to that of Mr. Harrison, that although it may not produce the desired stimulating effect on the uterus, there is no danger to be apprehended from its use in moderate quantities. He would therefore advise every practitioner and every farmer to have it at hand.

Some interesting accounts of its power of exciting uterine action in other animals are contained in the Numbers of the "*Veterinarian*" for September and October, 1833.

Mr. Skellett, in his work on "the Parturition of the Cow," (a truly valuable one as it regards the point now under consideration, the mechanical assistance that can be rendered in difficult and protracted labour,) observes, "As the business proceeds, and the pains increase in strength and rapidity, she confines herself to a lying posture, and in this posture she is delivered of the calf. When we reflect on this conduct of the animal, left to herself, we cannot too much reprobate the advice of those who recommend the driving her in the act of calving, or immediately before it takes place. The author has known a great many instances where it has proved the death of the cow, by producing inflammation and all its bad consequences. Every rational man will agree that the above practice is both cruel and inconsistent; for the animal herself, as soon as the hours of calving come on, immediately leaves the rest of the flock, and retires to some corner of the field, or under a hedge, in order to prevent the other cows or any thing else coming near that may disturb her in bringing forward her young."—P. 113.

If the head is sufficiently advanced to be grasped by the hands, or for a hand to be introduced by the side of it so as to urge it forward, an assistant at the same time laying hold of the fore-legs, and pulling with moderate force at each of the throes of the mother, the little animal may often be brought forward without endangering its life. If, however, it is firmly impacted in the passage, a cord with a slip knot should be fastened round each leg immediately above the fetlock, and a third cord around the lower jaw. Greater power may then be applied, the persons holding the cords pulling in concert, accommodating themselves to the natural pains of the mother, and exerting their strength, although somewhat forcibly, yet quietly and gradually. Here again the brutal violence resorted to by some persons is much to be reprobated; it inevitably destroys the calf, and endangers the life of the mother. If the foetus cannot be extracted by moderate force, one of the shoulders should be *slipped* (taken off), which may easily be effected by means of a small knife curved like those used for pruning, so as to be easily introduced into the passage in the hollow of the hand, and there used without danger of wounding the cow. An incision should be made in the fore-arm of the foetus, and the skin elevated and turned back by means either of the knife or the fingers. The shoulder may then be easily detached from the body and drawn out; and the bulk of the calf being thus materially lessened, the remainder of it will be readily extracted.

UNNATURAL PRESENTATION.

It will soon be evident whether the calf is in the right position. The appearance of the feet and the situation of the head will be satisfactory on this point: but from fright, or violence, or some unknown cause, the position of the foetus is sometimes strangely altered, so as to render its extraction difficult or impossible. Mr. Skellett has given a very useful account of these unnatural or false presentations and to which the reader is referred; a slight sketch only of the most frequent of them being here introduced.

In some cases, although the throes rapidly succeed each other and are not deficient in power, nothing, or perhaps only the mere hoofs, protrude from the vagina. This must not be suffered long to continue, for if it does, the strength of the cow will be rapidly wasted. The hand and arm, having been well oiled, must be introduced into the passage in order to ascertain the position of the foetus. The whole of the passage being probably well occupied by the head or fore-limbs, and the uterus and the vagina powerfully contracting, the arm of the operator will receive very considerable and benumbing pressure; and sometimes to such an extent that the

perfect feeling of the limb will not be restored until some hours have passed. This must not be regarded, but the surgeon must steadily, yet not violently, push the arm forward, taking care that he does not wound the cow with his nails.

If he finds the fore-feet far up the passage, and the head between them, but sunk down below the bones of the pelvis, he will immediately perceive that the extraction of the calf is impossible while it remains in this position. He will therefore pass a cord with a slip-knot round each of the feet, and push them back into the womb. Next, with the slip-knot of a third cord in his hand, he will push back the whole of the foetus gradually, but firmly, until he is able to get his hand under the head and elevate it and pass the noose round the lower jaw : then grasping the upper jaw and endeavouring thus to raise the muzzle above the rim of the pelvis, his assistants will draw the three cords and easily bring the head and the feet into the passage in the natural position.

If the head is not depressed between the feet, but bent down on one side below the passage, cords must be put round the fore-feet, and they are to be returned as in the other case. The head is to be sought out, and a noose passed round the jaw, and then the operator putting his hand against the chest of the foetus and pushing it back, his assistants are to gently draw the three cords, until the head and the feet are properly placed. Great care should, however, be taken that, in drawing out the fore-feet, the womb is not injured by the hoofs ; they should generally be brought forward separately and guarded by the hand of the operator within the womb. If there should be insuperable difficulty in raising and bringing the head round, and the calf is dead, the skin must be turned back from one of the legs, beginning at the fore-arm and reaching the shoulder, as already described, and the shoulder detached, which, considering the weakness of the muscles and ligaments at that age, will be readily effected. The assistant then pulling steadily at the legs, and the surgeon forcing the chest back into the belly, the extraction of the foetus will rarely be difficult.

It may happen that after many throes no portion of the foetus appears, but the calf is found turned in the womb, with his back resting on the belly of the mother, the feet against the spine, the head depressed below the bones of the pelvis, and the poll pressing against these bones. To turn the calf in this position will be difficult, and often impossible ; but, cords having been fastened, as before, to the feet and the lower jaw, the hand should be introduced under the head, so as to raise it in some measure, and enable the assistants, by means of the cords, to bring it and the feet into the passage. If the foetus should be dead, or the life of the mother appears to be in danger, it will be very easy, while in this position, to separate one or both shoulders, and the head may then be readily brought out.

It is not uncommon for the tail alone to be seen at the mouth of the passage. This is a breech presentation, and a very dangerous one. The calf cannot be expelled by the natural throes of the mother, the doubling of the hind legs offering an insuperable obstacle ; nor will it be possible for the foetus to be turned in the womb. The hand must be introduced ; one of the hocks searched out, and the noose end of a cord brought round it : next, the free end of the cord must be carried in and passed through the noose, which is to be tightened and fixed above the hock. The operator must then press against the breech, forcing the calf backwards and upwards, while the assistants draw the hock to the commencement of the passage by means of the cords. The surgeon should then shift his hand down to the hoof in order to guard the uterus, as the foot is brought over

the ridge of the pelvis. The other hock being afterwards drawn from under the foetus in the same way, the birth may be easily accomplished.

The birth being effected, the practitioner should examine the womb in order to ascertain the state of the placenta, and whether there is a second calf. The cases of twins will not often give the practitioner much trouble, for the calves are generally small and easily brought through the passage, unless they should both present themselves at the same time; therefore, at the commencement of every labour, the surgeon should carefully ascertain whether the parts presenting may not belong to two distinct calves; in which case one must be pushed back until the other is delivered, for in the attempt to extract them both together the mother and the calves would inevitably perish.

FREE-MARTINS.

The opinion has prevailed among breeders from time out of date that when a cow produces two calves, one of them a bull-calf and the other a cow, the male may become a perfect and useful bull, but the female will be incapable of propagation, and will never show any desire for the bull. The curious name of *free-martin* has been given to this animal. That accurate enquirer, Mr. John Hunter, spared no pains or expense to ascertain the real foundation of this belief; and he availed himself of the opportunity of examining three of these free-martins. In all of them there was a greater or less deviation from the external form and appearance of the cow; and in the head and the horns some approach to those of the ox; while neither of them had shown any propensity to breed. The teats were smaller than is usual in the heifer; but the outward appearance of the bearing was the same.

They were slaughtered, and he examined the internal structure of the sexual parts: he found in all of them a greater or less deviation from the form of the female, and the addition of some of the organs peculiar to the male; and he ascertained that they were in fact *hermaphrodites*. His description of one of them is given in the subjoined note, and will be interesting to the veterinary and medical student*.

It is not then a mere vulgar error that the female twin is barren; and Mr. J. Hunter has very satisfactorily accounted for the reason of her being so†. On the other hand, there are several well-authenticated in-

* "Mr. Arbuthnot's free-martin, seven years old. The external parts were rather smaller than in the cow. The *vagina* passed on, as in the cow, to the opening of the *urethra*, and then it began to contract into a small canal which passed on to the division of the uterus into the two horns, each horn passed along the edge of the broad ligament laterally towards the *ovaria*.

"At the termination of these horns were placed both the *ovaria* and the *testicles*. Both were nearly of the same size, which was about as large as a small nutmeg. To the *ovaria* I could not find any Fallopian tube.

"To the testicles were *vasa deferentia*, but they were imperfect. The left one did not come near the testicle, the right one only came close to it, but did not terminate in the body called the *epididymis*. They were both pervious and opened into the vagina, near the opening of the urethra.

"On the posterior surface of the bladder, or between the *uterus* and bladder, were the two bags called *vesiculæ seminales* in the male, but much smaller than they are in the bull. The ducts opened along with the *vasa-deferentia*. This animal then had a mixture of all the parts, but all of them were imperfect."—Philosophical Transactions, vol. lxi. p. 289.

† It is singular that the Romans should have called their barren cows *tauræ*, as if they had something of the bull about them. Columella, lib. vi. cap. 22, speaks of "*tauræ* which occupy the place of fertile cows, and should be sent away." Varro also, *De Re Rusticâ*, lib. ii. cap. 5, calls the barren cow *taura*. This would be a curious subject of inquiry

stances of these free-martins having bred. An anonymous writer in the "Farmer's Magazine, for November, 1806," describes a free-martin belonging to Mr. Buchan of Killintringham, that had a calf, and who was a handsome beast, with a well-placed udder, and was a good milker. The same gentleman, however, had another free-martin, which never bred. Another writer in the same Magazine, November, 1807, says, "on the 11th of November, 1804, a cow of mine brought forth two calves, one a bull, and the other a cow calf; and in spring last the female twin produced a very good male calf; yet a neighbour of mine assures me that a female twin belonging to him never would take the bull, and was sold on that account to the butcher at the age of four or five."

It would hence appear that the rule is, and a very singular anomaly in natural history it is, that the female twin is barren, because she is an hermaphrodite; but in some cases, there not being this admixture of the organs of different sexes, or those of the female prevailing, she is capable of breeding.

There have been instances of the cow producing three calves at one birth, but they have been so rare that there has been no record of the procreative power of the female. The editor of the 'British Farmer's Magazine,' May, 1828, speaks of three calves being produced by a small cow of the mixed Alderney and Yorkshire breeds, which in size, shape, and make, were a fac-simile of each other, and between which the most minute observer could not detect a difference.

There is a more singular account in a French periodical. A cow produced nine calves at three successive births; four at first, all females, in 1817; three at the second, of which two were females, in 1818; and two females, in 1819. All these, except two at the first birth, were nursed by the mother*.

THE CÆSARIAN OPERATION.

Some practitioners have lately recommended, in desperate cases, the opening of the side of the mother, and the extraction of the calf. The circumstances must indeed be desperate which can justify such a procedure. If, at the very earliest period of parturition, the veterinary surgeon can ascertain that there is a malformation of the pelvis, which will render delivery in a manner impossible, and the breed is a valuable one, and the mother, with this malformation, would never again be useful as a breeding cow, and no violent attempts have been made to extract the fœtus—nothing has been done which could set up inflammation, or give a disposition to inflammatory action; or if it can be clearly ascertained that there is a deformity in the fœtus, an enlargement of the head, or a general bulkiness, which will forbid its being extracted either whole or piecemeal, the practitioner might be justified in attempting this serious operation: but in a later stage of the process, when the usual measures have been adopted—when the parts have been bruised and injured, and the animal has been fatigued and worn out, and the fœtus itself probably has not escaped injury, such an operation can scarcely be defended on any principle of science or humanity. The writer of this work has twice attempted the operation, but in neither case did he save either the mother or the calf; nor is he aware of any English veterinarian who has succeeded. There is an account of one successful case by M. Chrétien†, but it is one only out of the several that he attempted, and he attempted this, because, on examination, he found that there was a hard tumour in the womb, which nearly half filled the cavity of the pelvis, and forbade the possibility of delivery.

* Nouveau Bulletin des Sciences.

† Journ. Pratique, 1826, p. 221.

In such case the experiment was justifiable, and it must have been very gratifying to M. Chrétien to have succeeded, but let not the dawn of veterinary science be clouded by the reckless infliction of torture on any of our quadruped slaves.

If a similar impossibility of delivery should occur in the practice of the veterinary surgeon, and equally justifying the experiment, the operation must be thus performed. The rumen must first be punctured at the flank, or some of the solution of the chloride of lime introduced, in order to get rid of any gas which it contains, and thus to bring the uterus better into view, and prevent as much as possible that pressure on it, and on the intestines, which will usually cause a troublesome and dangerous protrusion of them as soon as an incision is made into the belly. The animal is then to be thrown on the left side and properly secured; the right hind leg, being detached from the hobbles, must be brought as far backwards as possible, and fixed to some post or firm object, so as to leave the right flank as much exposed as it can be. Commencing about two inches before and a little below the haunch bone, an incision is now to be made through the skin, six or seven inches long, in a direction from above downwards, and from behind forwards, and this incision is afterwards to be carried through the skin, and the muscular wall of the flank. A bistoury being taken and two fingers introduced into the wound in order to protect the intestines, the wound is to be lengthened five or six inches more over the superior and middle part of the uterus.

At this moment, probably, a mass of small intestines may protrude; they must be put a little on one side, or supported by a cloth, and the operator must quickly search for the fore feet and head of the fœtus. An incision must be made through the uterus of sufficient length to extract the calf, which must be lifted from its bed, two ligatures passed round the cord, the cord divided between them, and the young one, if living, consigned to the care of a stander by, to be conveyed away and taken care of. The placenta is now to be quickly yet gently detached, and taken away. The intestines are to be returned to their natural situation, the divided edges of the uterus brought together and retained by means of two or three sutures, the effused blood sponged out from the abdomen, and the muscular parietes likewise held together by sutures, and other sutures passed through the integuments. Dry soft lint is then to be placed over the incision, and retained on it by means of proper bandages, and the case treated as consisting of a serious wound. Some valuable observations on this operation will be found in the *Dictionnaire de Méd. Vét.*, GASTRO-HYSTEROTOMIE.

EMBRYOTOMY.

In cases of malformation of the calf, or when, as now and then happens, the powers of nature seem to be suddenly exhausted, and no stimulus can rouse the womb again to action, the destruction of the fœtus, should it still live, and the removal of it piecemeal, is a far more humane method of proceeding, and much oftener successful. All that will be necessary will be a very small kind of pruning knife, already described, with the blade even a little more curved than those knives generally are, and that can be carried into the passage in the hollow of the hand with scarcely the possibility of wounding the cow. A case related by M. Thibeaudeau will best illustrate this operation*. 'I was consulted respecting a Breton cow twenty years old, which was unable to calve. I soon discovered the obstacle to the delivery. The fore limbs presented themselves as usual, but the head and

* Veterinarian, June, 1831, p. 346.

neck were turned backwards, and fixed on the left side of the chest, while the foetus lay on its right side on the inferior portion of the uterus.' M. Thi-beauveau then relates the ineffectual efforts he made in order to bring the foetus into a favourable position, and that he at length found that his only resource to save the mother was to cut in pieces the calf which was now dead. He afterwards describes the knife which he had manufactured for this purpose, and thus proceeds: 'I amputated the left shoulder of the foetus, in spite of the difficulties which the position of the head and neck presented. Having withdrawn this limb, I made an incision through all the cartilages of the ribs, and laid open the chest through its whole extent, by means of which I was enabled to extract all the thoracic viscera. Thus having lessened the size of the calf, I was enabled, by pulling at the remaining fore-leg, to extract the foetus without much resistance, although the head and neck were still bent upon the chest. The afterbirth was removed immediately afterwards. More recently I have employed the same instrument in operating upon a cow the neck of whose uterus was so constricted that the finger could scarcely be introduced; I divided the stricture, and saved both cow and calf.'

INVERSION OF THE WOMB.

In the convulsive efforts in order to accomplish the expulsion of the foetus, the womb itself sometimes closely follows the calf, and hangs from the bearing, as low as or lower than the hocks, in the form of a large red or violet coloured bag. This is called '*the downfall of the calf-bag*.' It should be returned as soon as possible, for there is usually great pressure on the neck of the womb, which impedes the circulation of the blood, and the protruded part quickly grows livid and black, and is covered with ulcerated spots, and becomes gangrenous and mortified; and this is rapidly increased by the injury which the womb sustains in the continual getting up and lying down of the cow in these cases.

The womb must first be cleansed from all the dirt which it may have gathered. If much swelling has taken place, and the bag looks thickened and gorged with blood, it should be lightly yet freely scarified, and the bleeding encouraged by warm fomentations. While this is done, it should be carefully ascertained whether there is any distension of the rumen, and if there is, either the common puncture for hoof should be made in the flank, or a dose of the solution of the chloride of lime administered. A distended rumen would form an almost insuperable obstacle to the return of the uterus. Two persons should now support the calf-bag by means of a strong yet soft cloth, while, if the placenta yet remains attached to it, a third person gently separates it at every point. It would be useless to attempt to return the womb until the cleansing is taken away, for the labour pains would return as violently as before. The operator will carefully remove the little collections, or bundles of blood-vessels, which belong to the foetal portion of the placenta, and which are implanted into the cotyledons or fleshy excrescences, that, for some reason, never yet fully explained, grow upon the surface of the impregnated womb, and gradually disappear again after the birth of the calf. If much bleeding attends this process, the parts are to be washed with a weak mixture of spirit and water. The bleeding being a little stayed, and every thing that may have gathered round the calf-bag being removed, the assistants should raise the cloth, and bring the womb on a level with the bearing; while the surgeon, standing behind, and having his hand and arm well oiled, and a little oil having been likewise smeared over the womb generally, places his right hand, with the fingers bent or clenched, against the fundus or bottom—the very inferior and far-

ther part of that cornu or division of the uterus which contained the foetus, and forces it through the passage, and as far as he can into the belly; and there he retains it, while, with the other hand, he endeavours likewise to force up the smaller horn, and the mouth of the womb. He will find considerable difficulty in effecting this, for the strainings against him will often be immense, and sometimes when he thinks he has attained his object the whole will again be suddenly and violently expelled. A bleeding from the jugular, and the administration of a couple of drachms of opium, will materially lessen these spasmodic efforts. The surgeon must, in spite of fatigue, patiently persist in his labour until his object is accomplished; and he will be materially assisted in this by having the cow either standing, or so placed on straw that her hinder parts shall be considerably elevated.

The practitioner should be careful that the parts are returned as nearly as possible into their natural situation, and this he will easily ascertain by examination with the hand. Much of the after quietness of the animal, and the retention of the womb thus returned, will depend upon this.

Although the return of the parts to their natural situation may be tolerably clearly ascertained, yet it will be prudent to provide against a fresh access of pain and another expulsion of the uterus. For this purpose it has been usual to pass three or four stitches of small tape through the lips of the bearing; but this is a painful thing and sometimes difficult to accomplish; and the cases are not unfrequent when these stitches are torn out, and considerable laceration and inflammation ensue.

A collar should be passed round the neck of the cow, composed of the kind of web that encircles the neck of the horse when he is confined for certain operations: a girth of the same material is then put round the body behind the shoulders, and this is connected with the collar, under the brisket and over the shoulder, and on each side. A second girth is passed behind the first, and a little anterior to the udder, and connected with the first in the same way. To this, on one side, and level with the bearing, a piece of stout wrapping cloth or other strong material, twelve or sixteen inches wide, is sewed or fastened, and brought over the bearing, and attached to the girth on the other side in the same manner. A knot on each side will constitute the simplest fastening, and this pressing firmly on the bearing will effectually prevent the womb from again protruding. If it should be necessary, another piece may be carried from below the bearing over the udder to the second girth, and a corresponding one, slit in order to pass on each side of the tail, may reach from above the bearing to the upper part of the second bandage.

The cow should be kept as quiet as possible; warm mashes and warm gruel should be allowed; bleeding should again be resorted to, and small doses of opium administered if she should be restless, or the pains should return; but it will not be prudent during the first day to give either those fever medicines, as nitre and digitalis, which may have a diuretic effect and excite the urinary organs, or to bring on the straining effect of purging, by administering even a dose of saline medicine. Should twenty-four hours pass and the pains not return, the stitches may be withdrawn from the bearing, or the bandage removed.

RUPTURE OF THE UTERUS.

Another more serious evil sometimes accompanies inversion of the womb, namely, a laceration or rupture of that organ, effected either by the unusually strong contraction of the womb, or by the violence with which the feet of the calf are drawn forward in the unskilful treatment of false presentation, or by the general concussion which accompanies the expul-

sion of the womb. The laceration is sometimes a foot in length, and is generally found on one side, and not far from the bottom of the uterus.

The animal needs not to be abandoned even in such a case, although there will be considerably more difficulty in returning the womb, because the same pressure cannot be made with the doubled hand on the bottom of it, and that difficulty may be increased by the furious state of the beast suffering such intensity of pain, and the whole frame disordered by such an accident. No time should be lost in vain efforts to bring the lacerated parts together and secure them by stitches; but, the womb having been well cleaned, the placenta removed, and the bleeding somewhat stayed, it must be returned as well and as speedily as can be managed, and the bandage applied, or the lips of the bearing secured by stitches: the cow should then be bled, and opiates administered. Nature will often do wonders here—the mischief will be repaired—the uterus will become whole again, and that without a tenth part of the fever that might be expected; and there are instances upon record in which the cow has suckled her calf, and produced another a twelvemonth afterwards*.

Rupture of the uterus may occur without protrusion of the part, from the too powerful action of that organ. The symptoms are obscure—they have not yet been sufficiently observed. They would probably be gradual ceasing of the labour pains—coldness of the horns and ears and mouth—paleness of the mouth—a small and accelerated pulse—swelling of the belly, and the discharge of bloody, glairy, fetid matter from the shape. Nothing can be done in such a case.

PROTRUSION OF THE BLADDER.

In long protracted labour, accompanied by pains unusually violent, the bladder has protruded. A practitioner mistook it for the water-bag, and punctured it. If the calf is not already born, it must be extracted as quickly as the case will admit, and that without scrupulous regard to the safety of the cow; for the protruded bladder can never be returned to its natural situation—in consequence of pain and inconvenience the animal can never afterwards carry high condition, but will be a miserable and disgusting object as long as she lives.

RETENTION OF THE FŒTUS.

It may happen that the pains of parturition gradually abate, and at length cease. If the cow has been much exhausted or injured by the continuance of the labour, or the efforts made to relieve her, and the fœtus has been wounded or broken, and considerable inflammation and fever have been set up, she will probably die; but if she is no more exhausted than may be naturally expected, and the fever is slight, and she eats a little, she should not be abandoned.

Mr. King, sen., of Stanmore, relates an instructive case of this kind.—‘A few years ago I was called to see a heifer which appeared to be rather losing condition, and which had been observed occasionally to void some offensive matter from the vagina. Before I could get to her, some portion of a calf’s fore extremity came away. The owner was very apprehensive of her doing well, and earnestly pressed the extraction of the remainder of the fœtus.

‘On examination I found the os uteri so small and contracted, that I could not pass my hand; and as the beast ate and drank, and was so little, either locally or constitutionally, disturbed, I persuaded him to leave her to nature, watching her in case of assistance being required. He consented,

* Veterinarian, October, 1828. Rec. de Méd. Vét. 1828, p. 365, and 1833, p. 294.

and, by degrees, and in detached portions, the greater part, or perhaps the whole of the calf (she was not confined) came away, and she did well, and became fat, and was sent to Smithfield market *.

The same gentleman relates another case which occurred in Stanmore some years previously. 'A cow, healthy, fine, and fat, was slaughtered. The uterus was found to contain the skeleton of a calf almost entire, all the soft parts having separated, and wholly escaped. Nothing of her history was known †.'

ATTENTION AFTER CALVING.

Parturition having been accomplished, the cow should be left quietly with the calf; the licking and cleaning of which, and the eating of the placenta, if it is soon discharged, will employ and amuse her. It is a cruel thing to separate the mother from the young so soon; the cow will pine, and will be deprived of that medicine which nature designed for her in the moisture which hangs about the calf, and even in the placenta itself; and the calf will lose that gentle friction and motion which helps to give it the immediate use of all its limbs, and which, in the language of Mr. Berry, 'increases the languid circulation of the blood, and produces a genial warmth in the half exhausted and chilled little animal.' A warm mash should be put before her, and warm gruel, or water from which some of the coldness has been taken off ‡. Two or three hours afterwards it will be prudent to give an aperient drink consisting of a pound of Epsom salts and two drachms of ginger. This may tend to prevent milk fever and garget in the udder. Attention should likewise be paid to the state of the udder. If the teats are sore, and the bag generally hard and tender, she should be

* Veterinarian, January, 1834.

† There is an instance on record of the head of a calf (all the other parts having passed away unobserved) being retained in the womb eighteen months. Pains resembling those of parturition then came on. The veterinary surgeon, on examination, detected a hard round body which he mistook for a calculus, and which was so firmly imbedded in the womb that he was compelled to have recourse to a bistoury in order to detach it. In a fortnight she seemed to be well.—*Instruct. Vétér.* tom. iv. p. 265. A more singular case is related by M. Coquet, in the same work, vol. ii. p. 317. A farmer in the neighbourhood of Neufchâtel purchased a cow that did not appear to be well;—her excrement was liquid, and she had excessive thirst; she gradually got worse, the appetite was lost, and the diarrhoea became more violent and offensive. On carefully examining the excrement, the farmer recognised pieces of bone. He sent for a veterinary surgeon, who picked out portions of ribs, bones of the leg, and an entire under jaw-bone. She died three weeks afterwards. The colon, at its last curvature, was very much enlarged; its walls were thickened, black, and gangrenous; and it was perforated on the inferior and right side; it contained a considerable mass of bones, particularly a pelvis, which, unable to follow the curvature of the intestine, had been imbedded there, and had also nearly penetrated through the intestine. The womb at that place was hard and thickened, and engorged with blood; the peritoneum was also inflamed, and there was considerable bloody and purulent effusion in the belly. It was evident that, on the death of the fœtus, whether by accident or in the process of parturition, inflammation of the womb and the intestine had followed; adhesion had taken place between them; suppuration, perforation, and the passage of the fœtus from the one to the other—that portion of the intestine being placed under that cornu of the womb. The uterus, having got rid of that which it contained, closed and healed; but the bones of the fœtus gradually separating, and passing along the mucous coat of the intestine produced a constant state of irritation, and at length the pelvis becoming imbedded there, a degree of inflammation was set up which speedily destroyed the animal.

‡ Can anything be more unnatural, absurd, or dangerous, than the following directions? 'After a cow has calved, it is advisable to let her have an opportunity of drinking as much cold water as she will, but by no means warm water; the latter opening the pores and letting in cold air: warm water is diluting, cold is bracing. It may be observed, that when cows calve in pastures, if there be water in the place, they are almost sure to calve near it.' Nature has taught them what they want. By drinking much cold water their urine is increased, and the continual straining to void it causes them to force their cleansing.—*Parkinson's Treatise on Live Stock*, vol. i. p. 1120.

gently but carefully milked three or four times every day. The natural, and the effectual preventive of this, however, is to let the calf suck her at least three times in the day if it is tied up in the cow-house, or to run with her in the pasture, and take the teat when it pleases. The tendency to inflammation of the udder is much diminished by the calf frequently sucking; or should the cow be feverish, nothing soothes or quiets her so much as the presence of the little one.

THE CLEANSING.

The placenta, or *after-birth*, or *cleansing*, should be discharged soon after the calving. It soon begins to act upon the uterus as a foreign body, producing irritation and fever; it likewise rapidly becomes putrid and noisome, and if it is then retained long, it is either an indication of a weakly state of the cow, or it may produce a certain degree of low fever that will interfere with her condition. Every cowleech, therefore, has his cleansing drink ready to administer; but it is too often composed of stimulating and injurious drugs, and which lay the foundation for after disease. The aperient drink recommended to be given after calving, with the addition of half a pint of good ale to it, will be the best assistant in this case and the only thing that should be allowed.

Should the cleansing continue to be retained, some have recommended that a weight of six or eight ounces should be tied to the cord, the gentle and continual action of which will usually separate the placenta from its adhesions, without any risk of hemorrhage*: but if the after-birth should still remain in the womb, and decomposition should evidently commence, the hand must be introduced into the passage, and the separation accomplished as gently as possible.

There is, however, a great deal more fear about this retention of the after-birth than there needs to be; and it is only the actual appearance of inconvenience or disease resulting from it that would justify a mechanical attempt to extract it. It is occasionally retained seven or eight days without any dangerous consequence.

BLEEDING (FLOODING) FROM THE WOMB.

This, although rarely, may follow natural parturition. It is oftener seen when the uterus has been wounded in the forcible extraction of the calf, and it still more frequently follows the long retention and mechanical separation of the after-birth. The application of cold to the loins will be most serviceable in this case. A pound of nitre should be dissolved in a gallon of water, and the loins and bearing of the cow kept constantly wet by means of cloths dipped in the solution. If the season of the year will permit, the water yielded by the melting of pounded ice mixed with salt may be used, being colder, and therefore more effectual. The cow may now drink cold water, and in any quantity that she may be inclined to take, and large doses of opium (two drachms every second hour) should be administered. The hinder parts of the cow should be elevated, in order that the blood may be retained in the womb, and coagulate there. She should be kept perfectly quiet, and the calf not permitted to suck. There are few hemorrhages from the womb, except those produced by absolute rupture of it, which will not yield to this treatment.

* There is no objection to this method of proceeding when the after-birth is actually retained in the uterus longer than it should be, but the common notion of its preventing the return of the cord into the womb is absurd.

MILK (PUERPERAL) FEVER.—DROPPING AFTER CALVING.

Although parturition is a natural process, it is accompanied by a great deal of febrile excitement. The sudden transferring of powerful and accumulated action from one organ to another—from the womb to the udder—must cause a great deal of constitutional disturbance, as well as liability to local inflammation.

The bitch, a few days after pupping, pants, heaves, refuses her food, becomes delirious, convulsed, and, unless speedily relieved, dies.

The ewe, soon after lambing, heaves at the flanks, separates herself from the flock, reels, falls, and dies.

So the cow, after parturition, is subject to inflammation of some of the parts the functions of which are thus changed: it is mere local inflammation at first, but the system speedily sympathises, and puerperal fever appears. It is called *dropping after calving* because it follows that process, and one of the prominent symptoms of the complaint is the loss of power over the motion of the hind limbs, and consequent inability to stand. In a great number of cases, loss of feeling accompanies that of voluntary motion; and no sense of pain is evinced, although the cow is deeply pricked in her hind limbs.

There are few diseases which the farmer dreads more, and that for two reasons; the first is, that the animal now labours under a high degree of excitement, and every local inflammation, and particularly near the parts in which the sudden change of circulation and of function has taken place, assumes a peculiar character, and an intensity, obstinacy, and fatality, unknown at other times: the second reason is, that from his inattention to the animal, or his ignorance of the real nature of the diseases of cattle, he does not recognise this malady until its first and manageable state, that of fever, has passed, and the strength of the constitution has been undermined, and helpless debility has followed. The first symptom which he observes, or which the practitioner has generally the opportunity to observe, is the prostration of strength which violent fever always leaves behind it. The early deviations from health are unobserved by the agriculturist, and probably would not always attract the attention of the surgeon.

This disease is primarily inflammation of the womb, or of the peritoneum, but it afterwards assumes an intensity of character truly specific. The affection is originally that of some particular viscus, but it soon is lost in a peculiar general inflammatory state, as rapid in its progress as it is violent in its nature, and speedily followed by a prostration of vital power that often bids defiance to every stimulus.

Cows in high condition are most subject to an attack of puerperal fever. Their excess of condition or state of plethora disposes them to affections of an inflammatory character at all times, and more particularly when the constitution labours under the excitement accompanying parturition. The poorest and most miserable cattle have, however, sometimes dropped after calving; and they have particularly done so when, on account of the approach of this period, they have been moved from scanty to luxuriant pasture, or from low keep to high stall feeding*.

* Mr. Hales very properly remarks, that "dropping after calving happens to cows that are very fresh and fat, and particularly to those that calve far on in the season in hot weather; but cows that are too fat often drop after calving in the winter; and it is observed that the cases that occur in the winter will frequently recover, while the animals that are thus attacked in hot weather too generally die."—*Veterinarian*, August, 1831.

Mr. Storry of Pickering very justly observes in a letter with which he favoured the editor,

A cow is comparatively seldom attacked with milk fever at her first calving, because in the present system of breeding she has seldom attained her full growth, and therefore the additional nutriment goes to increase of size instead of becoming the foundation of disease. Cases, however, do occur, in which cows of three years old have been speedily carried off by this complaint, but then they had been most injudiciously exposed to the influence of the forcing system.

Much depends on the quantity of milk which the cow is accustomed to yield; and great milkers, although they are not often in high condition, are very subject to this affection. All cows have a slight degree of fever at this time; a very little addition to that will materially interfere with the secretion of milk, and, perhaps, arrest it altogether; and the throwing back upon the system the quantity of milk which some of them are disposed to give, must strangely add fuel to fire, and kindle a flame by which the powers of nature are speedily consumed. Whether the present improved method of selection, whereby the properties of grazing and giving milk are united in the same animal, will increase the tendency to inflammation, and particularly to this dangerous species of fever, is a question deserving of consideration. It used to be objected to the Short Horns, that they were more liable to puerperal fever than the Long Horns were; and that it was oftener fatal to them. Much of this arose from the unfounded prejudice which existed against the Short Horns, when they were first introduced; yet the principle which has just been hinted at should never be forgotten by the breeder of short-horned cattle, that in a disease the early and almost uniform symptom and the most dangerous part of which is the suppression of the secretion of milk, that danger must increase in proportion to the quantity of the secretion thus suddenly arrested.

Puerperal fever sometimes appears as early as two hours after parturition; if four or five days have passed, the animal may generally be considered as safe: yet Mr. Leaver relates a case in which a fortnight elapsed between the calving and the dropping of the cow*.

The early symptoms of dropping after calving are evidently those of a febrile character. The animal is restless, shifting her feet, pawing, and she heaves laboriously at the flanks. The muzzle is dry and hot, the mouth open and the tongue protruded. The countenance is wild and the eyes staring. She wanders about mournfully lowing; she becomes irritable; she butts at a stranger, and sometimes even at the herdsman. Delirium follows; she grates her teeth, foams at the mouth, throws her head violently about, and, not unfrequently, breaks her horns. The udder becomes enlarged, and hot, and tender, at the very commencement of the disease. This is always to be regarded as a suspicious circumstance in a cow at that time; and if this swelling and inflammation are accompanied, as they almost uniformly are, by a partial or total suspension of the milk, that which is about to happen is plain enough.

The disease is an inflammatory one, and must be treated as such, and being thus treated, it is generally subdued without difficulty. The animal should be bled, and the quantity of blood withdrawn should be regulated by that standard so often referred to—that rule without an exception—the impression made upon the circulation. From six to ten quarts will probably be taken away, depending upon the age and size of the animal,

editor, that it often arises from the “very comfortable drink” which so many cow-leeches absurdly administer, before or after calving. In three cases which had occurred a little while before he wrote, he traced it to the freely giving of bean-meal to the cows on the day of parturition.

* Veterinarian, Aug. 1831.

before the desired effect is produced. There is no malady which more satisfactorily illustrates the necessity of endeavouring to subdue as quickly as possible every inflammatory complaint of cattle by the free use of the lancet; for all of them run their course with a rapidity which a person unaccustomed to these animals, and which the human practitioner especially, would scarcely deem to be possible. To-day the cow is seen with the symptoms just described—she is bled, and she is relieved; or she is neglected, and the fever has sapped the strength of the constitution, and left a fearful debility behind. The small bleedings to which some have recourse are worse than inefficient, for they only increase the natural tendency of these maladies to take on a low and fatal form.

A pound, or a pound and a half of Epsom salt, dependent on the size of the beast, must next be administered, with half the usual quantity of aromatic ingredients; and half-pound doses of the same must be repeated every six hours. Should not the medicine soon begin to act, the usual quantity of aromatic medicine must be doubled, for in addition to the constipation usually attending fever, there is that which arises from the occasional state of the rumen, and the passage leading to it, and that insensible stomach must be roused to action and excited to discharge its contents, in despite of the stimulating influence of the spice on the constitution generally. *The bowels must be opened*, or the disease will run its course; and, purging once established in an early stage, the fever will, in the majority of instances, rapidly subside, leaving the strength of the constitution untouched*.

After the physic has begun to operate, the usual sedative medicines should, if necessary, be given.

In a great number of cases, however, this all-important period will have passed away, and the practitioner will be called in to witness the fatal winding-up of the affair, and perhaps to be censured for his want of skill, when he is unable to accomplish impossibilities.

The digestive function first of all fails when the secondary and low state of fever comes on. The rumen ceases to discharge its food, and that being retained, begins to ferment, and the paunch and the intestines are inflated with fœtid gas, and the belly of the animal swells rapidly.

Next, the nervous system is attacked—the cow begins to stagger. The weakness is principally referrible to the hinder quarters, and rapidly in-

* The following testimony of Mr. Bainbridge of Saffron-Walden to the general efficacy of this mode of treatment is too important to be omitted, although perhaps the extent to which he carried the bleeding might not always be justifiable. "The months of February and March, 1833, afforded me several cases of dropping after calving. I immediately bleed to the amount of two gallons, or, in some cases, more, and give a draught composed of Epsom salts lb i, spirits of nitre ℥ss., and linseed oil lb. i, in plenty of thin gruel. I also order from four to six ounces of salts to be given in gruel every six hours afterwards; some ginger being always boiled with the gruel. If my patient is not relieved in twenty-four hours, and her state permits it, I bleed again, and repeat the salts, oil, &c. Out of six cases in the last two months five perfectly recovered."—*Veterinarian*, February, 1834, p. 74.

Mr. Friend considers this disease as closely connected with a disordered state of the digestive organs, and is a strenuous advocate for purgatives. He says, "Epsom salts in large quantities, Croton seed and sulphur are most to be depended upon. The salts act immediately on the abdomen and intestines, and are excellent pioneers for the Croton, whose action is more upon the other stomachs, and consequently very valuable. I dare not depend upon either alone; on the salts, because they are apt to pass the three first stomachs too quickly; or on the Croton, because it is so much slower in its operation, and cannot be so immediately extended in its effects. In conjunction they will perform wonders. Common salt is an excellent medicine, but rather objectionable where milk is an object, it having a tendency to diminish the secretion of that fluid."—*Veterinarian*, June, 1833.

creases. She reels about for awhile, and then falls; she gets up, falls once more, and at length is unable to rise; her head is bent back towards her side, and all her limbs are palsied; and now, when in too many cases no good can be done, the proprietor, for the first time, begins to be alarmed.

This portion of the "Farmer's Series" will not have been written in vain if it induces an earlier attention to the diseases of domesticated animals.

The duration of this second stage of puerperal fever is uncertain; but although it is usually more protracted than the first, the period in which hope may be reasonably encouraged is short indeed. If the cow is seriously ill, and off her feed, and does not get up again in two or three days, the chances are very much against her; the author, however, knew one that was saved after she had suffered considerable fever, and had been down nine days; and where debility is the principal symptom, and the cow seems to lie tolerably comfortable, and without pain, and picks a little, she may occasionally get up after she has been down even longer than that.

The treatment of this stage of the disease, although there has been a great deal of dispute about it, depends on one simple principle, the existence and the degree of fever. Notwithstanding there is debility, there may be fever; although the strength of the constitution may have been to a great degree wasted, there may be still a smothered fire that will presently break out afresh. In another point of view, much of this apparent weakness may be deceptive; it may be the result of oppression and venous congestion, and not of exhaustion.

The pulse will be the guide, and should be carefully consulted. Is it weak, wavering, irregular, dying away, pausing a beat or two, and then weakly creeping on again? We must not bleed here. These are indications of debility that cannot be mistaken—nature wants to be supported, stimulated, not still further weakened. The abstraction of blood would settle the business at once.

Is the pulse small, but regular, hard, wiry, and quickened—or is it full and quickened? Blood should certainly be taken away. These are as plain indications of secret and destructive fire as can possibly be given. The practitioner should bleed, but with the finger on the pulse, anxiously watching the effect produced, and stopping at the first falter of the heart. Many a beast has been decidedly saved by this kind of bleeding in dropping after calving; and many have been lost through neglect of bleeding. Some may have perished when the bleeding was carried too far, and some, if the animals were bled when the pulse gave indications of debility, but none when the pulse indicated power, and the possibility of febrile action.

There is a great deal of disgraceful dispute about the propriety or impropriety of bleeding in dropping after calving. One practitioner affirms that he never bleeds, and another that he always bleeds in this disease. One thing, however, is certain, that when the proprietor, or attendant on the cattle, hazards a random or sweeping assertion in this case, either for or against bleeding, he stands in need of a great deal of information with regard to the diseases of cattle; and when a professional man commits himself in this way, he proves that he is perfectly ignorant of his business and ought to go to school again. The propriety and impropriety of the abstraction of blood depends on the state of the pulse and the degree of fever—circumstances which vary in every case, and in different stages of the same case, and which accurate observation alone can determine.

Next, in order of time, and first of all in importance in this stage of the

disease, stands physic. The bowels must be opened, otherwise the animal will perish; but the fever having been subdued by a judicious bleeding, and the bowels after that being excited to action, the recovery is in a manner assured. The medicine should be active, and in sufficient quantity; for there is no time for trifling here. A scruple of the farina of the Croton-nut, and a pound of Epsom salt, will constitute a medium dose. For a large beast the quantity of the neutral salt should be increased. Doses of half a pound should afterwards be given every six hours until purgation is produced. The usual quantity of aromatic medicine should be added. Here, too, the constitution of the stomachs of cattle should not be forgotten. If twenty-four hours have passed, and purging has not commenced, even after the administration of such a drug as the Croton-nut, there is reason to suspect that the greater part of our medicine has not got beyond the rumen; and on account of the cuticular and comparatively insensible lining of this stomach strong stimulants must now be added to the purgative medicine, in order to induce it to contract upon and expel its contents. Two drachms each of ginger, gentian, and caraway powder, with half a pint of old ale, may, with advantage, be given with each dose of the physic.

It would seem superfluous to recommend the diligent use of injections in order to hasten the operation of the medicine had not some of the writers on cattle-medicine strangely objected to them*. Warm water, with Epsom salt dissolved in it, or warm soap and water, will form the best injection, and should be thrown up frequently, and in considerable quantities.

Should the constipation obstinately continue, it may be worth while to inject a considerable quantity of warm water into the rumen, and thus soften and dissolve the hard mass of undigested food, and permit the medicine to come more effectually into contact with the coats of the stomach. The warm water would also stimulate the stomach to contract, and thus get rid of a portion of its contents, either by vomiting or purging. In the first case, there would be room for the exhibition of more purgative medicine; in the other, the effect most of all desired would have been obtained.

The rumen will often annoy the practitioner in another way in this complaint: either on account of a vitiated secretion in that stomach, or from the retention of the food, which, exposed to the united influence of warmth and moisture, begins to ferment, there will be considerable extrication of gas, and the animal will swell with even more rapidity and to a greater extent than in simple hoove. The flanks should immediately be punctured, or the probang introduced, in order to permit the carburetted hydrogen to escape. A dose of the solution of the chloride of lime, as already recommended under "Hoove," should be given to prevent the extrication of more gas; and a greater quantity of aromatic and fever medicine should be added to the purgative, that the stomach may be roused to healthy action.

Ere this the practitioner will have thought it necessary to pay some attention to the comfort of the patient. This part of medical treatment is

* Mr. Knowlson has the following singular and ridiculous caution against the use of injections in dropping after calving:—"Many are for giving clysters, and I have known them given in this complaint until the animal has been blown as full of wind as she could hold, which was the direct way to cure her, for the clysters and air must fill the bowels, and yet some of these people call themselves cow-doctors. It is difficult enough to prevent her swelling, without giving her so many clysters as to cause her to swell."—P.

too often neglected. She should have been watched before she actually dropped, and got as soon as possible into the house, and well and warmly littered up. If she drops in the field it will always be difficult to get her home; and if she continues out, and bad weather comes on, she will assuredly be lost. She should be placed on one side, or, if possible, on her belly, inclining a little to one side, and, as much as can be managed in her usual position, and with her fore parts a little elevated, and she should be secured in that position by trusses of straw. She should be moved or turned morning and night, in order to prevent soreness and excoriation. Warm gruel and water should be frequently offered to her, and if these are obstinately refused, she should be moderately drenched with thick gruel. Bean and malt mash may be given with a little sweet hay: but it must be remembered, that while moderate nourishment is necessary to recruit her strength, and support her through such a disease, yet the digestive powers have usually shown that they have shared in the debility of the frame, and must not be too early, or too much taxed.

Having well opened the bowels and subdued the fever, the future proceedings of the surgeon must be regulated by the state of the patient. In general, little more will be necessary than attention to diet and comfort. At all events, tonics and stimulants should not be too hastily thrown in. It should be recollected, that the disease was essentially of a febrile nature. Experience will convince the practitioner, that there long remains a lurking tendency to the renewal of febrile action, and he will beware lest he kindles the fire afresh; but if the cow should continue in a low and weakly state, and especially if her remaining strength should seem to be gradually declining, gentian and ginger may be administered twice in the day, in doses of half an ounce of the first, and a quarter of an ounce of the second, and given in good sound ale; but the outrageous quantities of aromatics and bitters, and ardent spirits, that are occasionally given, cannot fail of being injurious.

It occasionally happens that the cow appears to recover a portion of strength in her fore-quarters, and makes many ineffectual attempts to rise, but the hind-quarters are comparatively powerless. This partial palsy of the hind extremities is the natural consequence both of inflammation of the womb and of the bowels. The best remedy is the charge which is generally applied to the horse. All embrocations are thrown away on the thick skin of the cow, and the constant stimulus of a charge and the mechanical support afforded by it, will alone effect the desired purpose. A week or ten days should be given to the animal, in order to see whether the power of voluntary motion in these limbs will return; but should the paralytic affection then remain, a sling must be contrived by which she may be supported, and during the use of which she may be enabled gradually to throw a portion of her weight on these legs, and reacustom them to the discharge of their duty.

A very singular variety of the disease has already been hinted at. The cow is down, but there is apparently nothing more the matter with her than that she is unable to rise; she eats, and drinks, and ruminates as usual, and the evacuations are scarcely altered. In this state she continues from two days to a fortnight, and then she gets up well*.

There is a common consent among the different organs of the frame both under healthy and diseased action. It has been stated that a partial or total suppression of the secretion of milk is frequently an early symptom, and, in some stage or other, an almost invariable one of the disease. Experience likewise shows that if the secretion of milk can be

* Veterinar, August, 1831

recalled, the restoration of the use of the limbs is not far distant. The teats should be frequently drawn, and the discharge of milk industriously solicited. This is a simple method of cure, but it is a far more effectual one than many imagine.

That milk-fever is sometimes epidemic there is every reason to suppose. The practitioner may, perhaps, be long without a case, but if one comes under his notice, he has reason to suspect that it will soon be followed by others. The contagious character by which it is so fatally distinguished in the human subject is not, however, so decided; but this is a subject which well deserves further inquiry.

That there is a constitutional tendency to this complaint cannot be denied. Beasts in high condition are peculiarly subject to it; and an animal that has once experienced an attack of it becomes exceedingly liable to the disease at her next, or at some future calving. Agriculturists are perfectly aware of this; and if a cow recovers from puerperal fever, her milk is dried, and she is fattened and sold without much loss of time.

Something may be and is done by many graziers in the way of prevention. If the cow is in a high, and consequently a dangerous state of condition, and has been fed on luxuriant pasture, it will be very proper, as has been already stated, to bleed her, and give her a dose of physic; and remove her to a field of shorter bite, a little before her expected time of calving. Many valuable animals have been saved by this precaution*.

SORE TEATS.

Cows are very subject to inflammation of the udder soon after calving. The new or increased function which is now set up, and the sudden distension of the bag with milk produce tenderness and irritability of the udder, and particularly of the teats. This in some cases shows itself in the form of excoriations or sores, or small cracks or chaps, on the teats, and very troublesome they are. The discharge likewise from these cracks mingles with the milk. The cow suffers much pain in the act of milking, and is often unmanageable. Many a cow has been ruined, both as a quiet and a plentiful milker, by bad management when her teats have been sore. It is folly to have recourse to harsh treatment to compel her to submit to the infliction of pain in the act of milking, she will only become more violent, and probably become a kicker for life; if by soothing and kind treatment she cannot be induced to stand, nothing else will effect it. She will also form a habit of retaining her milk, and which very speedily and very materially reduce its quantity. The teats should be fomented with warm water, in order to clean them and get rid of a portion of the hardened scabbiness about them, the continuance of which is the cause of the greatest pain in the act of milking; and after the milking, the teats should be dressed with the following ointment:—Take an ounce of yellow wax, and three of lard, melt them together, and when they begin to get cool, well rub in a quarter of an ounce of sugar of lead and a drachm of alum finely powdered.

* There are many absurd notions about this disease, prevailing in different districts, but none so ridiculous as M. Gellé describes as existing in La Vendée. A cow that he had attended, labouring under puerperal fever, died. The pretended medical man of the place declared that she had been killed by bleeding, and that there were hedgehogs which were the cause of her complaint, and which ought to have been taken away from her. If a cow in calf pastured, before the sun had risen, on any herb over which a hedgehog had passed, she would have a parcel of little hedgehogs in her womb with the calf. These wise men mistook the cotyledons found in the uterus of ruminants for little hedgehogs, and introduced the hand and tore them off without mercy as soon as the cow dropped.—*Journal Pratique*, 1826. p. 477.

GARGET.

Too often, however, the inflammation assumes another and worse character: it attacks the internal substance of the udder—one of the teats or the quarters becomes enlarged, hot, and tender—it soon begins to feel hard, it is knotty; it contains within it little distinct hardened tumours or kernels. In a short space of time, other teats, or other quarters probably assume the same character. The milk has coagulated in the bag to a certain degree, and it has caused local inflammation where it lodges. This occurs particularly in young cows after their first calving, and when they are in a somewhat too high condition, and it is usually attended by a greater or less degree of fever.

The most effectual remedy for this, in the early stage of the complaint, is a very simple one: the calf should be put to the mother, and it should suck and knock about the udder at its pleasure. In most cases this will relieve her from the too great flow of milk, and disperse all the lumps.

If the inflammation continues or increases, or the bag should be so tender that the mother will not permit the calf to suck; and especially should the fever evidently increase, and the cow refuse to eat, or cease to ruminate, and the milk become discoloured, and mixed with matter or with blood, the case must be taken seriously in hand. The cow should be bled; a dose of physic administered; the udder well fomented; the milk drawn gently, but completely off, at least twice in the day, and an ointment composed of the following ingredients, as thoroughly rubbed into the bag as the cow will permit. (Rub down an ounce of camphor, having poured a tea-spoonful of spirit of wine upon it; add an ounce of mercurial ointment, and half a pound of elder ointment, and well incorporate them together.) Let this be applied after every milking, the udder being well fomented with warm water, and the remains of the ointment washed off before the next milking.

If the disease does not speedily yield to this treatment, recourse must be had to iodine, which often has admirable effects in diminishing glandular enlargements. The only objection to iodine, and which renders it advisable to give the camphorated mercurial ointment a short trial, is that while, by its power of exciting the absorbents of the glands generally to action, it causes the dispersion of unnatural enlargements, it occasionally acts upon, and a little diminishes the gland itself. This, however, rarely happens to any considerable degree, and will not form a serious objection to its use when other means have failed. It should be applied externally in the form of an ointment (one part of the hydriodate of potash being well triturated with seven parts of lard), one or two drachms of which should be rubbed into the diseased portion of the udder, every morning and night. At the same time the hydriodate may be given internally in doses gradually increased from six to twelve grains daily.

The udder should be frequently examined, for matter will soon begin to form in the centre of these indurations, and should be speedily evacuated lest it should burrow in various parts of the bag, and, when at length it does find its way to the surface and bursts through the skin, irregular ulcers should be formed, at all times difficult to heal, and sometimes involving the loss of more than one of the quarters. Whenever there is any appearance of suppuration having commenced, (a minute observation will enable the practitioner to discover the very spot at which the tumour is preparing to point,) the diseased part should be freely and deeply lanced, and an immense quantity of matter will often be discharged. It is generally bad practice to cut off the teat; not only is it

afterwards missed in the milking, but the quantity of the milk is usually lessened to a greater or less degree.

Should the tumour have been left to break, a deep and ragged ulcer will then be formed, and must immediately be attended to, for the neighbouring part will be rapidly involved. Half of the bag has in some cases become mortified in a few days, and diseased portions have either dropped off, or it has been necessary to remove them in order to stop the spread of the gangrene. The chloride of lime is an invaluable application here. The wound should be well cleaned with warm water, and then a dilute solution of the chloride freely applied to every part of it; not only will the unpleasant smell from the ulcer be immediately got rid of, but its destructive progress will be arrested, and the wound will speedily take on a healthy character. When this is effected, recourse may be had to the Friar's balsam, but the occasional use of the chloride will be advantageous until the bag is perfectly healed.

Chronic indurations will sometimes remain after the inflammation of garget has been subdued; they will be somewhat tender, and they will always lessen the quantity of milk obtained from that quarter. The iodine will seldom fail of dispersing these tumours. The ointment just recommended should be well rubbed in twice every day, and if the enlargement does not speedily subside, the hydriodate should also be given internally. Mr. Christian, of Canterbury, and the author's friend, Mr. May, of Maldon, relate two cases of chronic garget, in one of which the induration had existed four months, and occupied two of the quarters, and was accompanied by the occasional discharge of blood; and in the other it had been observed more than a twelvemonth, and was increasing. An ointment was used by Mr. Christian, in the form of the iodine itself triturated with lard; and a liniment composed of the tincture of iodine with soot by Mr. May. In the course of three weeks, the udder was in both cases as well as if it never had been diseased*. The hydriodate of potash is, however, the most manageable and the most effectual preparation of iodine.

The causes of garget are various: the thoughtless and unfeeling exposure of the animal to cold and wet, at the time of, or soon after parturition, the neglect of physic or bleeding before calving, or suffering the cow to get into too high condition, are frequent causes. So powerful is the latter one, that instances are not unfrequent, of cows that have for some time been dried, and of heifers that have never yielded milk, having violent inflammation of the udder†. The hastily drying of the cow has given rise to indurations in the udder that have not easily been removed. An awkward manner of lying upon, and bruising the udder is an occasional cause; and a very frequent one is the careless habit of not milking the cow clean, but leaving a portion in the bag, and the best portion of the milk too, and which gradually becomes a source of irritation and inflammation in the part. Connected with this last cause is the necessity of the advice already given, to milk the cow as clean as possible at least twice in the day, during the existence and treatment of garget.

THE COW-POX.

The consideration of this disease may be conveniently introduced here.

* It often happens to fattening cows, but more in certain districts than others, so much so, that on some marsh lands in the county of Lincoln, a cow cannot be fattened, nor even a heifer that has never given milk: an ox has there been known to exhibit symptoms of garget.—Parkinson on Live Cattle, vol. i. p. 245.

† Veterinarian, Jan. 1830, and May, 1833.

Cows are subject to two distinct species of pustular eruption on the teats. Little vesicles or bladders appear; they often differ considerably in size and form, and are filled with a purulent matter. In the course of a few days a scab forms upon them, which peels off, and the part underneath is sound. If the pustules are rubbed off in the act of milking, or in any other way, small ulcers are left, which are very sore, and sometimes difficult to heal.

The best treatment is washing and fomenting; a dose of physic, and the application of the ointment for sore teats recommended in page 552. The cause, like that of many other pustular eruptions, is unknown; except that it is contagious, and is readily communicated from the cow to the milker if the hand is not quite sound, and from the milker to other cows.

There is another kind of pustular eruption, of a more important character, and with which the preceding one has been confounded. It also consists of vesicles or bladders on the teats; but they are larger, round, with a little central depression; they are filled at first with a limpid fluid, which by degrees becomes opaque and purulent, and each of them is surrounded by a broad circle of inflammation. This is more decidedly a constitutional disease than the former. The cow exhibits evident symptoms of fever; she does not feed well; sometimes she ceases to ruminate, and the secretion of milk is usually diminished.

These pustules go through a similar process with the former ones—they dry up, and at length the scabs fall off leaving the skin beneath sound; but if they are broken before this, the ulcers are larger, deeper, of a more unhealthy character, and generally far more difficult to heal. This is the genuine cow-pox.

The treatment is nearly the same, except that being accompanied by more constitutional disturbance, an aperient is more necessary, and it may occasionally be prudent to abstract blood. The frequent application of a Goulard's lotion, with an equal portion of spirit of wine, will, at least in the early stage of the ulcer, be preferable to the ointment; but better than this, and until the ulcers are beginning to heal, will be the dilute solution of the chloride of lime. If the teats are washed with this before the cow is milked, it will go far towards preventing the communication of the disease.

There is some difficulty respecting the cause of this disease. It is as contagious as the other, and, perhaps, usually propagated by contact; but it occasionally appears when there does not seem to have been a possibility of contact, directly or indirectly, with any other animal previously similarly affected. It was the opinion of Jenner, and is still the opinion of many medical men, that the cow-pox originated from infection by the matter of *grease in horses*, and which had been conveyed to the teat of the cow by means of the unwashed hands of some one who had the care of the horses while he was occasionally employed in the dairy*. This, when brought to the test of experience, has been proved to be altogether erro-

* "He (Jenner) conceived the sanious fluid of the grease to be the original disease, and the cow-pox, in the cow itself, to be nothing more than a casual inoculation produced by the cows lying down in a meadow, where the affected horse had been previously feeding, and her udder coming in contact with the discharge which had dropped on the grass and lodged there; and he endeavoured to show the identity of the fluids by the identity of their effects, in respect of the small-pox."—Dr. Mason Good's *Study of Medicine*, vol. iii. p. 59. Dr. George Gregory, in his "Practice of Physic," says, "It has been rendered highly probable, that the cow-pox is only a secondary disease in cows, that originally it is an affection of the hoof of the horse, communicated to man directly or to him through the cow."—p. 113.

neous. A pustular disease has been communicated by contact with the matter of grease, but it resembled far more the spurious vesicle that has been described in the last page than the genuine cow-pox. In a great many instances, however, nothing that could be considered as bearing any analogy to the true vaccine disease followed inoculation with the matter of grease. Woodville, Simmons, Professor Coleman of the Veterinary College, Bartholini, and others, failed entirely in producing cow-pox in this way; and Dr. Pearson very satisfactorily proved that the cow-pox was occasionally found in diseases where the attendants on the cows could have had no communication with greasy horses, nor, in fact, with any horses sick or well; and where the cows, likewise, had no access to pastures on which horses had fed for many years before. Whatever may still be the opinion of a few medical men, it will be difficult to find a veterinary surgeon whose life is spent amidst these diseases, and who ought to be well acquainted with their nature, causes, and effects, who believes that grease is the origin of cow-pox, or that there is the slightest connexion between them*.

The next interesting circumstance connected with this pustular eruption is, that the persons on whom it appeared were, for a considerable period, (it was once thought, during life,) protected from the small-pox. This was known among farmers from time immemorial, and that not only in England, and almost every part of the continent, but also in the New World. The majority of medical men, however, had regarded it as a mere popular error, and to no one, whom experience had convinced of the active protective power of the cow-pox, had it occurred to endeavour to ascertain, whether it might not be "possible to propagate the affection by inoculation from one human being to another, and thus communicate security against small-pox at will."

To the mind of Mr. Jenner, then a surgeon at Berkeley in Gloucestershire, the probability of accomplishing this, first presented itself. He spoke of it to his medical friends; but from every one of them he met with discouragement. They sportively threatened to banish him from their club, if he continued to tease them with his wild speculations. For more than twenty years he brooded on the subject, ere he could summon sufficient resolution to oppose himself to the ridicule of his friends and of the profession generally by making the decisive experiment. At length he inoculated a boy with the matter taken from the hands of a milkmaid, who had been infected by her master's cow. The disease was communicated, and with it the immunity which he expected. He multiplied his experiments, and he was successful in all of them; and, although his brethren and the public were slow to believe him, he at length established the power of vaccination, and proved himself to be one of the greatest benefactors to the human race that ever lived†. This account of the progress of vaccination is not out of place, since the prophylactic against that destructive scourge of the human race, the small-pox, was derived from the animal to the consideration of

* See a very candid and satisfactory statement of the argument on both sides in *Dictionnaire de Méd. et de Chirurgie Vét.* par Hurtrel d'Arboval, EAUX AUX JAMBES.

† The following picture of what passed in his mind before he had quite accomplished his object cannot fail of being interesting to the reader. "While the vaccine discovery was progressive, the joy felt at the prospect before me, of being the instrument destined to take away from the world one of its greatest calamities, blended with the fond hope of enjoying independence and domestic peace and happiness, were often so excessive, that in pursuing my favourite subject among the meadows, I have sometimes found myself in a kind of reverie. It is pleasant to me to recollect, that those reflections always ended in devout acknowledgment to that Being from whom this and all other blessings flow."—*Bacon's Life of Jenner*

whose general and medical treatment this work is devoted ; and some practitioners of no little eminence have recommended (and perhaps it deserves more consideration than has been given to it) a return* to the primary fountain for a recruit of power and energy after the lapse of a certain period, and the prosecution of a certain number of successive experiments.

CHAPTER XVIII.

THE GENERAL DISEASES AND MANAGEMENT OF CALVES.

THE management of the calf, so far as the profit of the farmer is concerned, belongs to the work on "British Husbandry," this volume having relation to that only which is connected with health, or disease, or general welfare, or improvement. In whatever manner the calf is afterwards to be reared, it should remain with the mother for a few days after it is dropped, and until the milk can be used in the dairy. The little animal will thus derive the benefit of the first milk, that to which nature has given an aperient property, in order that the black and glutinous fæces that had been accumulating in the intestines, during the latter months of the foetal state might be carried off. The farmer acts wrongly when he throws away, as he is too much in the habit of doing, *the beastings*, or first milk of the cow.

* Good's Studies of Medicine, vol. iii. p. 55; Gregory's Report, April, 1821. It was the opinion of Jenner, and it is still the belief of some sportsmen, that the cow-pox is a preventive against the distemper in dogs. It might be observed, that there is not the slightest similarity between the two diseases, but that, on the contrary, they affect perfectly different textures; it might also be urged that the description given of the distemper in dogs, by the advocates of the power of vaccination, is altogether so erroneous that no dependence can be placed upon it: the most satisfactory appeal, however, is to fact.

There is very great caprice with regard to the contagiousness of distemper, whether depending on certain modifications of the disease; or a certain degree of predisposition or the want of it in the animals exposed to the contagion; or on different states of atmospheric influence. The reason of it has never been sufficiently explained, but the fact admits of no denial, that during two or three successive years there may be isolated cases of it in a certain kennel, but the inhabitants of that kennel generally seem to possess a kind of immunity against its power; but in other years, no sooner does the distemper appear, than it rapidly spreads among the dogs, and carries off the majority of them. There is also no fact better known among sportsmen than that much of the susceptibility of infection depends on the breed. Some dogs, bred too much *in and in*, can scarcely be reared at all, while in others the disease can scarcely be distinguished from common catarrh. It was probably at some of these periods of security, or the subjects of his experiments belonging to some of these privileged breeds, that Dr. Sacco of Milan inoculated two hundred and thirty dogs with vaccine matter, and only one of them afterwards had the distemper and died; and it was probably when the contagious influence of the disease was more powerful, or the breed predisposed to take on the disease in its most fearful character, that Dr. Valentin of Nancy lost from distemper two dogs out of three which he had previously inoculated with vaccine matter; and that Gohier was quite unsuccessful in obtaining an immunity against the disease. The author of this work has inoculated more than sixty dogs, and the result of his experience is, that the vaccine matter neither destroys the contagion, nor mitigates the disease.

Numerous experiments were made on the effect of inoculation with the vaccine matter, in preventing or mitigating the scab in sheep, and the strangles in horses. The accounts given by the experimentalists are inconsistent to a degree scarcely credible; but public opinion seems to have decided that here too it was powerless. It was only in one of those moments of "reverie" pardonable in a mind enthusiastically devoted to the pursuit of a benevolent and noble object, and when the "wish is father" to many a conclusion, that it could be believed that the cow pox would afford protection against *rabies*.—Dict. de Méd. et de Chirurgie Vét., VACCINATION.

NAVEL-ILL.

The calf being cleaned, and having begun to suck, the navel string should be examined. Perhaps it may continue slowly to bleed. In this case a ligature should be passed round it closer, but, if it can be avoided, not quite close to the belly. Possibly the spot at which the division of the cord took place may be more than usually sore. A pledget of tow well wetted with Friar's balsam should be placed over it, confined with a bandage, and changed every morning and night; but the caustic applications, that are so frequently resorted to, should be avoided.

Sometimes when there has been previous bleeding, and especially if the caustic has been used to arrest the hemorrhage, and at other times when all things have seemed to have been going on well, inflammation suddenly appears about the navel between the third, and eighth, or tenth day. There is a little swelling of the part, but with more redness and tenderness than such a degree of enlargement would indicate. Although there may be nothing in the first appearance of this to excite alarm, the navel-ill is a far more serious business than some imagine. Mr. Sitwell, an intelligent breeder at Barmoor Castle in Northumberland, says, "that in his part of the country, as soon as the calf takes on this disease, they consider it as dead; and butchers and graziers will not purchase any calves until the usual time for having the disorder is passed*." Fomentation of the part in order to disperse the tumour,—the opening of it with a lancet if it evidently *points*, and the administration of two or three two-ounce doses of castor oil, made into an emulsion by means of an egg, will constitute the first treatment; but if, when the inflammation abates, extreme weakness should come on, as is too often the case, gentian and laudanum, with, perhaps, a small quantity of port wine, should be administered.

CONSTIPATION.

If the first milk or *beastings* has been taken from the calf, and constipation, from that, or from any other cause, succeeds, an aperient should be administered without delay. The sticky black fæces, with which the bowels of the newly-born calf are often loaded, must be got rid of. Castor oil is the safest and the most effectual aperient for so young an animal. It should be given, mixed up with the yolk of an egg, or in thick gruel, in doses of two or three ounces; and even at this early age, the carminative which forms so usual and indispensable an ingredient in the physic of cattle must not be omitted—a scruple of ginger should be added to the oil.

Constipation of another kind may be prevented, but rarely cured. If the weather will permit, and the cow is turned out during the day, and the calf with her, the young one may suck as often and as much as it pleases—the exercise which it takes with its mother, and the small quantity of green meat which it soon begins to crop, will keep it healthy; but if it is under shelter with its dam, and lies quiet and sleepy the greater part of the day, some restraint must be put upon it. It must be tied in a corner of the hovel and not permitted to suck more than three times during the day, otherwise it will take more milk than its weak digestive powers will be able to dispose of, and which will coagulate, and form a hardened mass, and fill the stomach and destroy the animal. The quantity of this hardened curd which has sometimes been taken from the fourth stomach almost exceeds belief. This is particularly the case when a foster mother, that probably had calved several weeks before, is given to the little one, or the calf has too early been fed with the common milk of the dairy. The only chance

* British Farmer's Magazine.

of success in this disease lies in the frequent administration (by means of the stomach-pump, or the drink poured gently down from a small horn) of plenty of warm water, two ounces of Epsom salt being dissolved in the quantity used at each administration.

At a later period, the calf is sometimes suffered to feed too plentifully on hay, before the manyplus has acquired sufficient power to grind down the fibrous portions of it. This will be indicated by dulness, fever, enlargement of the belly, and the cessation of rumination, but no expression of extreme pain. The course pursued must be the same. The manyplus must be emptied either by washing it out, by the frequent passage of warm water through it, or by stimulating it to greater action, through the means of the sympathetic influence of a purgative on the fourth stomach, and the intestinal canal.

A tendency to costiveness in a calf should be obviated as speedily as possible—it is inconsistent with the natural and profitable thriving of the animal, and it can never long exist without inducing a degree of fever, always dangerous, and generally fatal. The farmer is sadly inattentive here, and loses many of his best young stock, for they are generally the most disposed to costiveness.

DIARRHŒA.

The disease, however, to which calves are most liable, and which is most fatal to them, is purging. It arises from various causes—the milk of the mother may not agree with the young one; it may be of too poor a nature, and then it produces that disposition to acidity, which is so easily excited in the fourth stomach, and the intestines of the calf; or, on the other hand, it may be too old and rich, and the stomach, weakened by the attempt to convert it into healthy chyle, secretes or permits the development of an acid fluid. It is the result of starvation and of excess—it is the almost necessary consequence of a sudden change of diet; in fact, it is occasionally produced by every thing that deranges the process of healthy digestion.

The farmer needs not to be alarmed although the fæces should become thin, and continue so during two or three days, if the animal is as lively as usual, and feeds as he was wont; but if he begins to droop, if he refuses his food, if rumination ceases, and he is in evident pain, and mucus, and perhaps blood, begin to mingle with the dung, and that is far more fœtid than in its natural state, not an hour should be lost. The proper treatment has already been described under the titles of diarrhœa and dysentery, pp. 475, et seq. A mild purgative (two ounces of castor oil, or three of Epsom salt) should first be administered, to carry away the cause of the disturbed state of the bowels. To this should follow anodyne and astringent and alkaline medicines, with a mild carminative. The whole will consist of opium, catechu, chalk, and ginger. The union of these constitutes the medicine known under the name of the “Calves’ Cordial;” but the carminative generally exists in unnecessary and dangerous proportions. The proportions of each have already been given in p. 476, when describing the treatment of diarrhœa. The use of this mixture should be accompanied by frequent drenching with starch or thick gruel; by the removal of green or acescent food, and by giving bran mashes, with a little pea or bean flour.

HOOSE.

A sufficiently alarming view has been given of this disease in adult cattle, but calves are even more subject to it: it takes on in them a more

dangerous character, and more speedily terminates in wasting and in death. Hoose often assumes an epidemic form in cattle of a twelvemonth old and upwards; it often appears as an epidemic among calves, and carries off great numbers of them. The treatment recommended for grown cattle under the article Hoose, in p. 378 et seq., should, with such deviation as the different age and situation of the beast require, be adopted here. The bleeding, perhaps, should not be carried to so great an extent, and even somewhat more attention should be paid to the comfort of the animal.

CASTRATION.

There used to be a strange difference of opinion among farmers as to the time when this operation should be performed. In some parts of the north of the kingdom it is delayed until the animal is two years old; but this is done to the manifest injury of his form, his size, his propensity to fatten, the quality of his meat, and his docility and general usefulness as a working ox. The period which is now pretty generally selected is between the first and third months. The nearer it is to the expiration of the first month, the less danger attends the operation.

Some persons prepare the animals by the administration of a dose of physic; but others proceed at once to the operation when it best suits their convenience, or that of the farmer. Care, however, should be taken that the young animal is in perfect health. The mode formerly practised was simple enough:—a piece of whipcord was tied as tightly as possible round the scrotum. The supply of blood being thus completely cut off, the bag and its contents soon became livid and dead, and were suffered to hang, by some careless operators, until they dropped off, or were cut off on the second or third day.

It is now, however, the general practice to grasp the scrotum in the hand, between the testicles and the belly, and to make an incision on one side of it, near the bottom, of sufficient depth to penetrate through the inner covering of the testicle, and long enough to admit of its escape. The testicle immediately bursts from its bag, and is seen hanging by its cord. The careless or brutal operator now firmly ties a piece of small string round the cord, and having thus stopped the circulation, cuts through the cord half an inch below the ligature, and removes the testicle. He, however, who has any feeling for the poor animal on which he is operating, considers that the only use of the ligature is to compress the blood-vessels and prevent after hemorrhage, and therefore saves a great deal of unnecessary torture, by including them alone in the ligature, and afterwards dividing the rest of the cord. The other testicle is proceeded with in the same way, and the operation is complete. The length of the cord should be so contrived that it shall immediately retract into the scrotum, but not higher, while the ends of the string hang out through the wounds. In the course of about a week the strings will usually drop off, and the wounds will speedily heal. It will be rarely that any application to the scrotum will be necessary, except fomentation of it, if much swelling should ensue.

A few, but their practice cannot be justified, seize the testicle as soon as it escapes from the bag, and, pulling violently, break the cord and tear it out. It is certain that when a blood-vessel is thus ruptured, it forcibly contracts, and very little bleeding follows; but if the cord breaks high up and retracts into the belly, considerable inflammation has occasionally ensued, and the beast has been lost. This tearing of the cord may be practised on smaller animals, as pigs, or lambs, or rabbits; the vessels are small, and there is but little substance to be torn asunder:

but even there the knife, somewhat blunt, will be a more surgical and humane substitute. This laceration should never be permitted in the castration of the calf or the colt.

The application of *torsion*, or the twisting of the arteries by means of a pair of forceps which will firmly grasp them, promises to supersede every other mode of castration, both in the larger and the smaller domesticated animals. The spermatic artery is exposed, and seized with the forceps, which are then closed by a very simple mechanical contrivance; the vessel is drawn a little out from its surrounding tissue, the forceps are turned round seven or eight times, and the vessel liberated. It will be found perfectly closed; a small knot will have formed on its extremity; it will retract into the surrounding substance, and not a drop more blood will flow from it: the cord may be then divided, and the bleeding from any little vessel arrested in the same way. Neither the application of the hot iron or of the wooden clams, whether with or without caustic, can be necessary in the castration of the calf*.

* In many parts of France the bull-calf is castrated by means of a curious species of *orsion*, termed *bistournage*. The animal is thrown and secured; the operator places himself behind the animal, and opposite to the tail; he seizes the testicles with both his hands, and pushes them violently upwards and downwards several times, in order to destroy their adhesion to their coverings. He continues this manipulation until he thinks that he has produced sufficient lengthening of the cords, and dilatation of the bag itself; he then pushes up the left testicle as nearly as possible to the ring, leaving the right one low in the bag; he seizes the cord of the right testicle between the finger and thumb of the left hand, about an inch above the testicle, and grasping the bottom of the scrotum with his right hand, he turns the testicle, and pushes it forcibly upwards, until he has reversed it, and its inferior extremity is uppermost. Some little practice is required in order readily to effect this. Then, the right hand holding the testicle while the left hand raises the cord, the testicle is turned round from right to left four or five, or six times, until there is a degree of tension and difficulty in the turning, which indicates that the spermatic vessels are so far compressed or obliterated as to be deprived of the power of secreting or conveying the seminal fluid. The testicle is by this means brought up nearly to the abdominal ring, where it is retained by turning the scrotum over it, while the left testicle is brought down, reversed, and turned in the same manner. Last of all, in order to prevent the untwisting of the cords and the descent of the testicles, the operator grasps the bottom of the scrotum in his left hand, and holding one end of a piece of cord, eighteen inches in length, and about as large as a quill, between his teeth, and having the other end in his right hand, he makes with it several turns round the scrotum with considerable firmness below and close to the testicles, yet not so tightly as quite to stop the circulation of blood through the bag. This is taken away at the end of the second day, after which the testicles will remain fixed against the abdomen, and will gradually wither away. The animal is usually bled after the operation, and half of its allowance of food is for a while taken away, and it may be sent to pasture on the second or third day, if the weather is favourable.

This mode of castration does not appear to be very painful to the animal, and is rarely attended by any dangerous results. It is, however, principally adapted for young cattle; for when the muscle of the scrotum is powerful, especially in cold weather, and when there is much adhesion between the testicle and its surrounding tunics, the torsion of the testicle is scarcely practicable. The animals that are thus emasculated are said to preserve more of the form of the bull than others from whom the testicles are excised: they also retain more of the natural desires of the bull, and are occasionally very troublesome among the cows.—Dict. de Méd. et Chirurg. Vet. CASTRATION.

CHAPTER XVIII.

DISEASES OF THE MUSCULAR SYSTEM AND OF THE EXTREMITIES.

RHEUMATISM.

Although some writers have been strangely averse to acknowledge the existence of this disease in the horse, no farmer has a doubt of its frequent occurrence in cattle. It is inflammation of the fascia, or cellular coat of the muscles, and also of the ligaments and synovial membranes of the joints. If a cow has been necessarily, or carelessly and cruelly, exposed to unusual cold and wet, particularly after calving, or too soon after recovery from serious illness, she will often be perceived to droop. She becomes listless, unwilling to move, and by degrees gets off her feed. If urged to move, there is a marked stiffness in her action, at first referrible chiefly, or almost entirely, to the spine; and she walks as if all the articulations of the back and loins had lost their power of motion. She shrinks when pressed on the loins; and the stiffness gradually spreads to the fore or hind limbs. The farmer calls it *chine fellon*; if it gets a little worse, it acquires the name of *joint fellon*, and worse, unless care is taken, it speedily will become. Some of the joints swell: they are hot and tender; the animal can scarcely bend them; and he cannot move without difficulty and evident pain.

Who could doubt that the same causes which produce rheumatism in the human being will produce it also in the quadruped? Where is either the proof or the probability of exemption? Thus we find rheumatism in cattle chiefly prevalent in a cold, marshy country—in places exposed to the coldest winds—in spring and in autumn, when there is the greatest vicissitude of heat and cold—in animals that have been debilitated by insufficient diet, and that cannot withstand the influence of sudden changes of temperature—in old cattle particularly, and such as have been worked hard, and then turned out into the cold air, with the perspiration still hanging about them.

It seems to assume the acute and the chronic form as evidently as it does in the human being. One animal will labour under considerable fever; he will scarcely be able to move at all, or when he does, it extorts from him an expression of suffering. Another seems to be gay and well, when the air is warm and dry; but as soon as the wind shifts, or immediately before it changes, he is uneasy, and comparatively helpless. On some portions of a farm, nothing seems to ail the cattle; on others, lower, moister, or more exposed, the cattle crawl about stiffly and in pain. In some extreme cases, the quantity of milk rapidly diminishes, and the cow wastes away and becomes a mere skeleton.

The rheumatism in cattle, as in the human subject, may be palliated, but rarely removed. The treatment of it consists in making the animal comfortable—in sheltering her from the causes of the complaint—in giving her a warm aperient, which, while it acts upon the bowels, may determine to the skin, as sulphur, with the full quantity of ginger. The practitioner will afterwards give that which will yet more determine to the skin, as antimonial powder, combined with an anodyne medicine, almost any preparation of opium;—and he will have recourse to an embrocation stimulating to the skin, and thus probably relieving the deeper seated pain, as camphorated oil, or spirit of turpentine and laudanum.

SWELLINGS OF THE JOINTS.

These are usually the consequence of rheumatism. Small tumours appear in the neighbourhood of the joints that were most affected. They seem at first to belong to the muscles; but they increase: they involve the tendons of the muscles, and then the ligaments of the joints, and the lining membrane of the joints. When this is the case, other diseases are at hand—inflammation of the lungs or bowels; but, oftenest of all, rheumatism degenerates into palsy*.

The superficial veins in the neighbourhood of the joints sometimes become full and large; they grow decidedly varicose. When the causes of rheumatism are removed, the situation of the animal changed, and the weather has become more congenial, the lameness decreases, the swellings diminish, but the varicose veins remain.

The enlargements of the joints connected with, or the consequences of rheumatism are removed—but in the majority of cases only temporarily—by stimulating embrocations, of which spirit of turpentine or the compound one of turpentine, ammonia, camphorated spirit, and laudanum, is the most effectual. Some, however, will not disappear without the application of the cautery.

There are other tumours about the joints, and particularly the knees of cattle, which are not necessarily connected with rheumatism, and in many cases quite independent of it, although they are found only in beasts that are out at pasture.

They are of two kinds. The first occupies the fore-part of the knee, and generally one knee at a time. A fluid collects in the tissue immediately beneath the skin, and which yields to the pressure of the finger. The pressure causes no pain, nor is there any inflammation of the skin, but there is some degree of lameness. The tumours insensibly increase; they still contain a fluid. Inflammation is now sufficiently evident: the lameness is very great; the animal is incapable of work, and the motion of the joint is almost destroyed.

Frictions with turpentine and hartshorn are often employed: sometimes one composed of tincture of cantharides is used. These occasionally disperse the tumours for a while, but they speedily re-appear. The budding

* Mr. Tait of Portsoy gives an interesting account of these affections of the joints, under the designation of "*Crochles*." He says that the early symptoms are pains in the feet, and particularly the fore-feet, with enlargement of the joints; the hind-quarters particularly becoming so weak and contracted that the animal can scarcely stand; and sometimes she lies for many weeks without the power of moving. If she is neglected she certainly dies; and then the cartilages of the joints are always ulcerated, and sometimes nearly destroyed. Mr. Tait has no faith in any medicine or external application; but he believes that the removal of the animal to a more comfortable situation, and particularly to a drier pasture, will, in the early stages of the complaint, be attended with decided good effect. It is a very simple remedy, and is worth a trial.

A brother practitioner related a very curious anecdote of the occasional treatment of this disease, which Mr. Tait gives in his own words:—"Soon after commencing practice in this district, I was particularly struck with the appearance of a cow belonging to a cottar. On inquiring into the cause of the animal's apparent helplessness, my informant stated to me that 'she had had the crochles, but was now in a way of getting better, a man having pared out the worm that was the cause of the awful complaint; that the man knew the very spot where the worm lodged, and that he appeared to have great experience, having travelled much as a *beggar*.' In fact, he had sawn off two inches from each claw of her feet. The cow was in a woful plight; her joints enlarged, her muscles shrunk, and her skin clinging to her bones."

After remonstrating with the cottar on his folly, Mr. Tait's friend persuaded the cottar to remove her to a farm which the disease had never visited. The animal in a very short time began to move about, and would have become perfectly sound, had not "the beggar" removed a part of the bones of her feet along with the worm.—*Veterinarian*, August, 1834.

iron is a more effectual remedy. If the tumour is pierced with it, a glairy fluid escapes, and the swelling subsides. A blister should then be applied, and the animal kept in the cow-house. The tumour does not often return, but it is a considerable time before the lameness quite disappears.

A more frequent species of tumour is of a hard character. It does not yield at all to pressure; it evidently causes considerable pain, and the animal is very lame. These tumours are almost invariably confined to one knee. Here, neither frictions nor perforation with the budding-iron will be of material benefit, although deep firing has sometimes succeeded.

Other tumours, sometimes immediately on the joints, and at other times at a greater or less distance from them, and of variable degrees of hardness; sometimes adhering to and identified with the substance beneath, and at other times more or less pendulous, do not appear to give much pain to the animal, nor do they often interfere with the motion of the joints, but they are a great eyesore, and, in a few instances, they suddenly take on a disposition to increase with great rapidity. These have been blistered without effect—setons have been passed through them with variable result, and occasionally recourse has been had to excision.

Some surgeons have very lately begun to treat them with iodine; the ointment of the hydriodate of potash has been well rubbed into the tumours and the neighbouring parts; and the hydriodate has at the same time been administered internally. The success of this treatment with the two last species of tumours, has been almost as great as the practitioner could desire. They have uniformly very much diminished in size; and in the great majority of cases they have disappeared. The ointment should be composed as already recommended, and six grains of the hydriodate given morning and night in a mash. On the first species of tumour unconnected with rheumatism, the iodine has seldom had decided effect.

ULCERS ABOUT THE JOINTS.

These tumours sometimes assume very much the appearance of farcy in the horse. They run in lines, they follow the apparent course of the veins, but they belong to the absorbents. They frequently ulcerate—the wounds are painful, deep, and spreading. They have already been described (p. 313,) when the question of farcy in cattle was considered.

The dilute solution of the chloride of lime will form the best application, and will usually be successful; especially if occasionally aided by some caustic wash, as a solution of blue vitriol, or dilute nitric acid.

OPENED JOINTS.

These sometimes occur from the injudicious lancing of the first kind of tumour, but oftener from accident. The principle of the treatment of open joints is the same as was recommended in the "Treatise on the Horse," p. 242, namely, to close the orifice as soon as possible, and before the secretion of the joint oil is stopped, and the cartilages of the opposing bones rub on each other, and the delicate membrane which lines these cartilages becomes inflamed, and the animal suffers extreme torture, and a degree of fever ensues by which he is speedily destroyed. The wound is best closed by means of the firing iron. For a description of the operation the reader is referred to "the Horse," under the title "Broken Knees."

SPRAINS.

Working oxen, and those that have been driven long journeys, are liable

to *sprain*, and particularly of the fetlock joint. The division of the lower part of the cannon or shank bone, in order that it may articulate with the two pasterns into which the leg is divided renders this joint particularly weak and susceptible of injury. The treatment is the same as in the horse, and consists of fomentation of the part, to which should succeed bandages very gradually increasing in tightness, cold lotions, and afterwards, if the deep-seated inflammation cannot otherwise be subdued, stimulating applications, blistering, or, as the last resource, firing. The inflammation attending sprain of this joint is often very great, and enormous bony enlargement and ankylosis are not unfrequently seen. They embrace the fetlock joint; they frequently include the pastern: but oftener, the inflammation and bony enlargement extend up the leg, and particularly the posterior part of it almost to the knee; for the division of the flexor tendons, in order to reach both toes, takes place considerably above the fetlock (the precise place varying in different animals), and these, from the oblique direction which they take, are peculiarly liable to strain, with probability of serious injury. The firing iron must be severely applied before the mischief has proceeded to this extent.

DISEASES OF THE FEET.

These are numerous and serious. The leg of the ox is divided at the fetlock. There are two sets of pasterns, two coffin bones, and two hoofs to each leg. The shank-bone is double in the fœtus, but the cartilaginous substance between the two larger metacarpals is afterwards absorbed, and they become one bone; the lower bones, however, continue separate. Each division has its own ligaments and tendons, and is covered by its own integument. This gives rise to various inflammations and lamenesses, which have been confounded under the very objectionable term of

FOUL IN THE FOOT.

Hard and irritating substances often insinuate themselves between the claws, and becoming fixed there, and, wounding the claws on one or both sides, become a source of great annoyance, pain, and inflammation, and the beast suddenly becomes lame, and the pasterns are much swelled. They should be carefully examined, the interposed substance should be removed, the wound washed thoroughly clean, and a pledget of tow dipped in friar's-balsam, or covered with healing ointment, introduced between the claws, and there confined by means of a roller. Lameness from this cause will, in general, be readily removed.

The foot being thus divided, and the ox unexpectedly treading on an uneven surface, or being compelled long to do so when ploughing a steep field, the weight of the animal will be unequally distributed on the pasterns, and severe sprain will be the result. This is indicated by the sudden lameness which comes on, and by the swelling and heat and tenderness being confined to one claw, and referrible to the fetlock or pastern, or coffin joints. Rest and fomentation, or the application of cold, with bleeding from the veins of the coronet will usually remove this kind of lameness. The bleeding may be easily effected by means of a small fleam or lancet, for the veins of the foot of the ox are larger and more tortuous than those of the horse, and rise more distinctly above the coronet, and climb up the pastern. It is the increased vascularity which often gives so serious a character to sprains of the coffin or pastern joints in the ox, and disposes to ankylosis of these joints much oftener than in the horse.

The foot of the ox, or that part which is inclosed within the horny box, is liable to the same injuries and diseases as that of the horse; but they generally are not so difficult to treat, nor do they produce such destructive consequences, because the weight of the animal being divided between the two claws, the first concussion or injury was not so great, and the animal was able afterwards to spare the injured claw, by throwing a considerable portion or the whole of the weight on the sound one. Injuries of the feet arise from pricking in shoeing, wounds from nails or glass, or from the sole being bruised, and sometimes the horn being worn almost through, by travelling or working on hard roads.

It is generally believed that there is a constitutional tendency to diseases of the foot in cattle, resembling the rot in sheep; but this has never been satisfactorily proved*, and the simplest explanation of the matter is, that inflammation was produced by some external cause; that it ran its usual course; that suppuration followed, and matter was formed; that it burrowed in various parts of the foot, and broke out at the coronet; that sinuses remained; that the ulcer took on an unhealthy character; fungus shooted up, in short there was the quittor or canker of the horse, but on a smaller scale and more manageable. This is a simple view of the case, and at once points out a mode of treatment, intelligible and generally successful.

It is true that *foul in the foot* is most prevalent in low marshy countries; but the hoof is there softened, macerated by its continual immersion in moisture, and rendered unable to resist the accidents to which it is occasionally exposed. It is there that canker and quittor are most prevalent in the horse, and most difficult to be treated.

When a beast becomes suddenly lame he should be taken up, and, if necessary, secured. The lameness will generally be referrible to one claw. The heat, and tenderness, and redness, and enlargement round the coronet will prove this. The foot should be carefully examined—is there any prick or wound about the sole? if so, let the horn be pared away there—let the matter which is pent up within escape—let the horn be removed as far as it has separated from the sensible parts beneath—let a little butyr of antimony be applied over the denuded part—let a pledget of soft dry tow be bound tightly upon the part, and let the animal be placed in a dry yard or cow-house.

If there is no evident wound, let the foot of the beast, like that of the horse, be tried round with the pincers; and if he decidedly flinches when pressed on a particular part, let the foot be opened there—let the coronet be closely examined—is there any soft reddish spot upon it? if so, freely plunge the lancet into it.

If the examiner is foiled in this attempt to discover the seat of mischief, let him envelop the foot in a poultice; that will soften the neighbouring parts, and cause even the horn to be a little more yielding, and will abate the inflammation; if it should be pure inflammation without previous mechanical injury, that will hasten the process of suppuration, and the matter will more quickly, and with less destruction to the neighbouring parts, find its way to the coronet. As soon as it does so, the soft projecting red or black spot should be opened, and a probe should be introduced into the

* M. Favre of Geneva, instituted numerous experiments, in order to ascertain whether the foot-rot in sheep, and foul in the foot in cattle, were the same or similar diseases. He inoculated sheep with the matter taken from between the claws, and with some from the denuded surface of the sole, and some also which he had taken from a sinus running deep into the foot in neither case did he produce anything analogous to the foot-rot.—Journal de Méd. Vét. et Comparée, 1826, p. 319.

opening and the sinuses carefully ascertained, and every portion of detached horn removed from above them, and the healthy horn around thinned and smoothed. It will always in these cases be prudent to administer a dose of Epsom salt.

The character of the surface exposed should now be considered. If, the matter having been all evacuated, the wound or wounds have a tolerably healthy appearance, a light application of the butyr of antimony, and that repeated daily, will soon induce a secretion of new horn; but if there is a portion of the surface that looks black or spongy, or the edges of which are separated from the parts around, here was, probably, the original seat of injury—the life of that portion has been destroyed and it must be removed—it *must slough out*. A poultice of linseed meal, with a fourth part of common turpentine, must be put on, changed twice in the day, and continued until the separation is complete. A light application of the butyr should then follow, or in favourable cases, a pledget soaked in friar's balsam should be placed on the wound, bound tightly down, and daily renewed; the removal of every portion of detached horn, dryness, firm, but equable pressure on the part, and moderate stimulus of the exposed surface, are the principles which will carry the practitioner successfully through every case of foul in the foot.

Nothing has been said of the fungous excrescence between the claws, in order to remove which, as well as to stimulate the surface beneath and dispose it to throw out healthy horn, the cart-rope or the horse-hair line used to be introduced between the claws, and drawn backwards and forwards, inflicting sad and unnecessary torture on the animal. This fungus will rarely make its appearance, if the horn, which had lost its attachment to the living surface beneath, yet still continue to press upon it, has been carefully removed. If any fungus appears, it should be levelled by means of a sharp-knife, and the caustic applied*. There can be no doubt, that pure inflammation, without wound or mechanical injury, does sometimes attack the feet of cattle, especially of those that are in high condition. On one day the beast is perfectly free from lameness, or illness of any kind; on the following day probably the foot is swelled, *the claw st and apart from each other*, they are unusually hot, and the animal can scarcely rest any portion of his weight on one foot; he is continually shifting his posture, or he lies down and cannot be induced to rise. If the beast is neglected, the inflammation and swelling increase until an ulcer appears at the division of the claws, and which cannot be healed until a considerable core has sloughed out.

A linseed-meal poultice should be applied to the part as soon as this inflammation is observed, and it may be easily retained in its situation by means of a cloth through which two holes have been cut to admit the claws. This will either abate the inflammation or hasten the suppuration; and as soon as the swelling begins to point it should be opened. The poultice must be continued until this sloughing process has taken place, or the ulcer begins to have a healthy surface, a little common turpentine

* The following recipe is copied as a perfect unique in veterinary practice:—"My father's method (of curing foul in the foot) was to cut up a sod where the diseased foot had trodden, and either turn it over sward side downwards, or hang it on a hedge in that position. I am unable to account for this cure; to me it is incomprehensible; but in all the experiments I have tried, this remedy, so simple and cheap, has proved the best. The first year I was at Slane, we had many cattle troubled with this complaint; I applied nothing else but what may be called a charm, and they all more readily recovered than when I used severer applications; therefore, in future, I mean never to have recourse to any remedy but the sod, though probably rest is the great restorative."—Parkinson on Live Stock, vol. i. p. 245.

having been added to it. Proud flesh must be subdued by the caustic; equal parts of verdigris and sugar of lead will constitute the best application for this purpose. Foul and foetid discharge must be corrected by the chloride of lime; and when the ulcer looks healthy, the tincture of myrrh or friar's balsam must be used.

By this mode of treatment the disease will readily be subdued, but the application of corroding caustic substances in the early stage of it will add fuel to fire; and the suffering the abscess to remain unopened until the pus has burst its way through the thick skin of the leg will produce sinuses that will run in every direction, remain open month after month, and leave permanent lameness behind. Some have imagined that this variety of foul in the foot is contagious. That is not quite ascertained, although there are some suspicious cases on record; the farmer, therefore, will act prudently who immediately separates the lame beast from the herd.

In one respect, these diseases of the feet of cattle differ materially from quittor or canker in the horse. There is a laminated connexion between the hoof of the ox and the sensible parts beneath as in the horse; but the horny plates of the hoof and the fleshy ones of the substance which covers the coffin-bone are not so wide or so deep, and therefore the attachment between the hoof and the foot is not so strong. Thence it happens that the matter finds great difficulty in forcing a way for itself in the foot of the horse, and deep sinuses are formed which reach to, and corrode the bone, and there is sometimes core upon core to be detached, and portions of bone to be thrown off, and whence results the cankered state of the foot, and the difficulty of cure. In cattle less resistance to the progress of the matter is experienced; the hoof is more easily separated from the parts beneath, and that which would produce deep ulceration and caries in the one, rarely to be perfectly repaired, leads to the casting of the hoof in the other, while the foot has received comparatively little injury. The form of the foot, in these cases, is much changed, and all its functions impaired in the one; in the other a new hoof speedily covers a foot that has escaped all serious detriment, and the animal becomes as useful as he ever was. Cases, however, do sometimes occur in which the hoof is lengthened and curved, and twisted in a very curious way, and the coffin bone takes on a similar distortion.

There is no *frog* in the foot of cattle, nor are there the provisions for the expansion and elasticity of the foot which we admire in the horse; therefore there is not any disease that can be considered as corresponding with the "*thrush*" in that animal, but there is occasionally something not much unlike *grease*. A sore appears upon the heel, not however so much in the form of a crack as of a circular superficial ulcer. It has a brown unhealthy hue; fungus often springs from it*, and it causes considerable lameness. It is best treated with the chloride of lime, or that and a strong solution of alum may be alternately applied. A bandage should seldom be used because it can scarcely be put on without excoriating the parts and increasing the evil, and because the ox is much more impatient of the restraint of the bandage than is the most fidgetty or vicious horse.

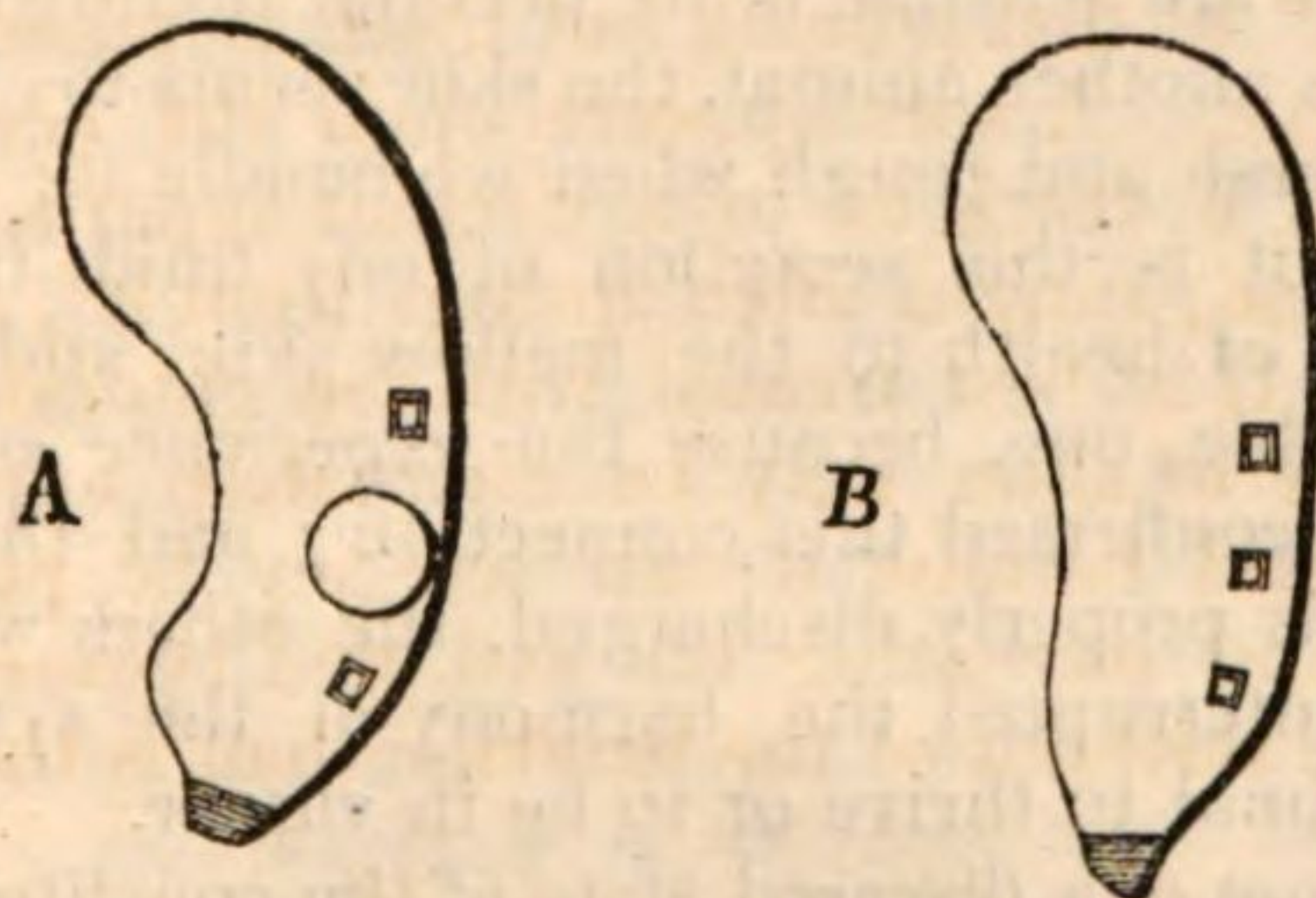
Constant pain seems to prey more speedily and injuriously on cattle

* Where the case has been neglected, projection of the fungus sometimes hardens and acquires a resemblance to the *grapes* on the heels of greasy horses; more frequently, however, it becomes like a seedy wart, and is very tender and troublesome, and bleeds after the slightest touch. The chloride or butyr of antimony is the best remedy for this

than on the horse—ruminants have not the courage and endurance of this noble animal, and therefore it is that these diseases of the feet soon begin very materially to interfere with the condition of the beast. It has been remarked (p. 304), that “there is not a farmer that has not had cows in his dairy that have lost for a time full half of their milk on account of the pain which tender and diseased feet have occasioned; the grazier sometimes loses the advantage of three or four months’ feeding from the same cause, and in London dairies, tender feet are often a most serious ailment, and compel the milkman to part with some of his best cows, and that in very indifferent condition.” These things would indicate the propriety of having recourse to the operation of neurotomy. It is an operation which, resorted to in proper cases, will never be undervalued as it regards the horse; and the time is not far distant, when veterinary surgeons, better instructed in the anatomy and ailments of cattle, will often practise it to relieve the torture, and to improve the condition of ruminants.

SHOEING

This, as in the horse, is a necessary evil. A beast used for road work would soon be crippled and ruined without shoes; and the farmer would find it his interest never to send an ox to plough unshod. He would be well repaid for the expense of shoeing by the increased speed, the greater capability of work, the endurance and the superior condition of his cattle. Little skill is required in the smith in order to adapt the shoe to the foot of the ox; there is no weakness of particular parts, no corn, no tenderness of frog, no disposition to contraction to be studied; the simple principle is to cover the sole effectually. Around the outer rim the shoe should follow the line of the foot—it should somewhat project inwardly towards the toe, and be rounded towards the heel, with the projection likewise inward. It should be fastened by three nails on the outer edge, the posterior nail being about the middle of that edge. The nails should be thin, and flat-headed, so that when driven close they shall occupy a considerable portion of the ground surface of the fore part of the shoe. Both the ground and foot surfaces should be flat, and the shoes made of good iron, but thin and light. The only difference between the fore and the hind shoe is that the hind shoe is thinner and lighter, not quite so broad or so much curved, and, particularly, more pointed, and more turned up at the toe.



A. The ground-surface of the fore-shoe.
B. Do. of the hind shoe.

Some farmers shoe the fore feet only, others take in the two outside claws of the hind feet; but it would be little additional trouble or expense to shoe them *all round*, and then they would be safe.

The principal objection to shoeing the ox arises from the difficulty of putting the shoes on. The beast will seldom submit quietly, and recourse must be had to the *trevis*, or to casting him. The latter is dangerous, and frequently accompanied by accident either to the ox or the smith. The best *trevis* is that recommended by Bakewell, a description and engraving of which may be found in the "British Husbandry," p. 221. Much of the unruliness of the beast, however, might be overcome by kind treatment, and by often handling the steer, and lifting his feet, and striking them gently with a hammer. Finding that no harm is done to him, he will permit this without fear, and he will be likely to submit to the apparently similar process of shoeing. It is fear, and not natural indocility, which causes the resistance of the beast.

CHAPTER XIX.

THE DISEASES OF THE SKIN.

THE skin of the ox differs little from that of the horse, except that it is thicker, and apparently less sensible; therefore for some observations on the structure and functions of the skin, the reader is referred to the *Treatise on the Horse*, p. 369; they apply equally to the greater part of our domesticated animals.

The horseman properly attaches great importance to the state of the skin in that animal. If it is hard and dry, and unyielding, he says that the horse is out of condition; and then he knows full well that although the animal may have no decided disease about him, yet he is scarcely capable of discharging his ordinary duty, and altogether unequal to any extraordinary exertion. Graziers know as well that the beast whose skin is not soft, and mellow, and elastic, can never carry any profitable quantity of flesh and fat; therefore they judge of the value of the animal even more by the handling than they do by the conformation of parts.

The skin is filled with innumerable little glands which pour out an oily fluid, that softens and supple it, so that we can easily take it between the finger and thumb, and raise it from the parts beneath; and while we are doing this, we are sensible of its peculiar mellowness and elasticity. At another time or in another animal, the skin seems to cling to the muscles beneath, and feels harsh and rough when we handle it: but the skin is not altered or diseased, it is this secretion of oily fluid that is suspended. We attach the idea of health to the mellow skin, and of disease to the harsh and immoveable one, because the experience of ourselves and of everybody else has confirmed this connection; and the principle is that when one secretion is properly discharged, the others will generally be so, and when one is interrupted the harmony of the system is too much disturbed for the animal to thrive or to be in vigour.

Then, as a symptom of a diseased state of the constitution generally, the attention is first directed to

HIDE-BOUND.

The term is very expressive—the hide seems to be bound, or to cling to the muscles and bones. It does not actually do so, but it has lost its

softness, and we can no longer raise it, or move it about. The secretion of the oily fluid which supple the skin is disturbed; this argues disturbance elsewhere, and the feeling of the skin usually indicates the degree of that disturbance.

With hide-bound is connected a rough and staring coat. The surface of the skin is become hard and dry; the minute scales with which it is covered no longer yield to the hair, but separating themselves in every direction, they turn it in various ways, and so give to it that irregular and ragged appearance which is one of the characteristics of want of condition.

These two circumstances—hide-bound and a staring coat—are unerring indications of evil. A cow may be somewhat off her feed—she may hoose a little—she may have various little ailments; they should not be neglected; but while the skin is loose and the hair lies smooth the farmer has not much to fear: if, however, the coat begins to stare, and the skin to cling to the ribs, it behoves him to examine into the matter. What disease unobserved has been preying upon the constitution?—has hoose been degenerating into phthisis?—has some chronic affection of the liver been weakening the strength of the digestive organs? or what has been wrong in the management of the beast? Has she been unnecessarily and cruelly exposed to cold and wet—has she been fed on unwholesome provender, or has she been half starved?

If the thrifty appearance cannot be traced to any evident cause, still there can be no doubt that something is wrong. Hide-bound is rarely a primary disease; it is a symptom of disease, and oftener than of any other disease of the digestive organs. A dose of physic should be given (eight ounces of sulphur, with half an ounce of ginger), and a few mashies should be allowed. After this medicines should be administered that have a tendency to rouse the vessels of the skin to their due action, as sulphur, nitre, and antimonial powder, with a small quantity of ginger. No direct tonic should be administered while the cause of this want of condition is unknown, but warm purgatives and diaphoretic medicines will often have a good effect.

MANGE.

^{*} This is the most serious among the diseases of the skin in cattle. The first symptom is a constant itchiness. The cow eagerly rubs herself against everything that she can get at. The hair comes quite off or gets thin on various parts of the body. There are few scabs or sores; but either in consequence of the rubbing, or as an effect of the disease, a thick scurfiness appears, particularly along the back, and in patches on other places. It is first seen about the tail, and thence it spreads in every direction. The cow soon begins to lose condition, the ridge of her back becomes prominent, and her milk decreases, and sometimes is deteriorated in quality.

The causes are various; they are occasionally as opposite as it is possible for them to be. Too luxuriant food will produce it; it will more certainly follow starvation. The skin sympathizes with the over-taxed powers of digestion in the one case, and with the general debility of the frame in the other: and nothing is so certain of bringing on the worst kind of it as the sudden change from comparative starvation to luxuriant food. Want of cleanliness, although highly censurable, has been oftener accused as the cause of mange than it deserves; but to nothing can it more frequently be traced than to contagion.

The treatment is simple and effectual. The diseased cattle should be removed to some distant stable or shed where there can be no possible

communication with the others. The disease, however produced, must be considered and treated as a local one. The scurfiness of the skin must first be got off, by means of a hard brush, or a curry-comb, somewhat lightly applied. To this must follow the application of an ointment which appears to have a specific effect on the mange, and which must be well rubbed in with a soft brush, or, what is far better, with the hand, morning and night: there is no danger of the disease being communicated to the person so employed. That ointment must have sulphur as its basis, aided by turpentine, which somewhat irritates the skin and disposes it to be acted upon by the sulphur; and, to render it still more efficacious, a small portion of mercury must be added. The following will be a safe, and very effectual application—there are few cases which will resist its power. “Take of flowers of sulphur a pound, common turpentine four ounces, strong mercurial ointment two ounces, and linseed oil a pint. Warm the oil and melt the turpentine in it; when they begin to get cool add the sulphur, and stir the ingredients well together, and afterwards incorporate the blue ointment with the mass by rubbing them together on a marble slab.”

Vast numbers of cattle have been lost by the use of stronger and poisonous applications. Corrosive sublimate, in the form of an almost saturated solution of it, is a favourite lotion with many practitioners*. Arsenic—hellebore—tobacco† have had their advocates, and have murdered thousands of cattle.

The practitioner must not, however, confine himself to mere local treatment, physic should always be administered. Sulphur, in doses of eight ounces every third day, will materially assist in effecting a cure; and on the intermediate days nothing better can be given than the powder recommended for hide-sound (p. 571). Mashes also should be allowed every night.

LEPROSY.

Mange neglected or improperly treated may degenerate into a worse disease, but fortunately not one of frequent occurrence. The scurf will be succeeded by scabs—there have been cases in which the scabs have appeared from the beginning—and the skin becomes thickened and corrugated, and covered with scales, and occasionally the scales peel off, and corroding ulcers appear beneath.

* The author of this Treatise attended five cows belonging to a gentleman that were afflicted with bad mange. He applied the ointment and the powders here recommended, and the case was going on slowly but satisfactorily. He did not wish to make too much haste in the business, for the disease had been of considerable standing, and the animals had been much reduced by it. He was afraid of a worse evil if he repelled this confirmed and general cutaneous eruption too quickly. The gentleman, however, was impatient; the cowherd was more so, and the case was put under the hands of a farrier. He brought a great bottle of some lotion; he applied it freely about them; he used almost the whole of it. In a little more than twelve hours one of them began to foam at the mouth—she staggered, fell, and died. In less than twenty-four hours they were all dead. The first practitioner was sent for in great haste, and arrived just in time to witness the death of the last cow. He secured the bottle: it contained a strong solution of corrosive sublimate mixed with some unknown vegetable decoction.

† A friend of the Editor was requested to see four cows that had been dressed for mange. One of them was dead when he arrived; another died afterwards; the other two recovered, and were found to be cured of the mange. Another friend who sometimes uses a decoction of tobacco, says that he is sometimes thoroughly frightened by it—that the animal breaks out into profuse perspiration, and falls and rolls, and there is great prostration of strength; and that nothing should induce him to have recourse to this mode of treatment, except in his own stables, and under his immediate inspection.

The same ointment, but with double the quantity of mercury, must be used for this aggravated state of the disease, and a stronger alterative powder, consisting of two drachms of Ethiop's Mineral, added to the one already recommended. All this mercury, however, must be used with caution, for it is not a drug that always agrees with the ruminant; and salivation would, temporarily at least, and in most cases permanently, injure the beast, both for the dairy and the pasture.

In those sadly aggravated cases that come under the observation of the practitioner, in which the whole of the skin is thickened and corrugated, with deep chaps running down on either side, or uniting together in various directions—when within the substance of the skin numerous tubercles can be felt, varying from the size of a millet-seed to that of a kidney-bean—when the eye-lids are swelled so that the animal can scarcely see, and a great quantity of mucus is discharged from them—when the nostrils and lips are thickened, and dense and yellow mucus runs from the nose—when, beginning from the knees, and reaching almost to the hoofs, the intervals between the chaps are occupied by tuberculous grapes, of different sizes, and some of which discharge a serous fluid;—in such cases the surgeon may well be puzzled what to do.

The animal must be bled and physicked; but his strength must be supported by mashes and plenty of fresh green meat: he must be fomented all over many times every day, and he must be kept where he cannot communicate the infection. If the inflammation does not begin to subside, he must be bled again and again; the physic must be repeated; sulphur will constitute the best physic here, and he must be kept under its purgative influence: and, at length, the skin beginning to supple—the cutaneous inflammation having, to a considerable degree, subsided—the ointment and the powder recommended for mange must be used. Should they not have sufficient effect, recourse must be had to the stronger ones prescribed for leprosy. Previous, however, to the use of either of the ointments, and after the inflammation has abated, the solution of the chloride of lime may be applied on two or three successive days with much advantage*.

LICE.

Connected with mange, the usual accompaniment, and probably the occasional cause of it, is the appearance of vermin on the skin. It cannot be supposed that they are originally produced by any disease or state of the skin; but the ova (eggs) of these animalculæ, floating in the atmosphere, find in the skin of cattle, under certain circumstances, and under those alone, a proper nidus, or place where they may be hatched into life. A beast in good health and condition will not have one of those insects upon him unless he mixes with lousy cattle; but if he is turned out in the straw-yard in winter, and is half-starved there, and his coat becomes rough, and matted, and foul, they will soon swarm upon him. By the constant irritation which they excite, they will predispose the skin to an attack of mange from other causes, if they do not actually produce it.

He who had not personal observation of the fact, would hardly believe how numerous they soon become. There are myriads of them on the hide of the ill-fated beast. They keep him in a constant state of torment, and are, in a manner, devouring him before his time. It cannot be surprising

* For illustrations of this form of the disease, the reader is referred to a Memoir, by M. Santin, on Elephantiasis in cattle, and also to the *Journal Pratique* for 1829, p. 421; and for 1831, p. 10. A useful paper will also be found in the *Réc. de Méd. Vét.*, 1830, p. 42.

that they rapidly spread from one animal to another. The slightest contact, the lying on the same lair, or the feeding on the same pasture, is sufficient to enable them to be communicated from the infected beast to all the rest. The animalcule thrives everywhere, although the ovum did not find a proper nidus on the skin of the healthy beast; and the vermin, once established there, soon change the character of the skin, and cover it with scurf and mange.

Various powders and lotions have been recommended for the destruction of these parasites. A powder can scarcely be brought into contact with a thousandth part of them; nor can a lotion, unless used in a quantity sufficient to kill the beast as well as those that are feeding upon him. An ointment is the most convenient application, and by dint of rubbing, a little of it may be made to go a great way. The common scab ointment for sheep (one part of strong mercurial ointment and five of lard) will be effectual for this purpose; and if a little of it is well rubbed in, instead of a great deal being smeared over the animal, there will be no danger of salivation.

WARBLES.

Towards the latter part of the summer and the beginning of autumn, and especially in fine and warm weather, cattle out at pasture are frequently annoyed by a fly of the Diptera order and the *Æstrus* genus, that seems to sting them with great severity. The animal attacked runs bellowing from his companions, with his head and neck stretched out, and his tail extending straight from his body, and he seeks for refuge, if possible, in some pool or stream of water. (The fly seems to fear, or to have an aversion to the water, and cattle are there exempt from its attack.) The whole herd, having previously been exposed to the same annoyance, are frightened, and scamper about in every direction, or, one and all, rush into the stream. Under the excitation of the moment, they disregard all control; and even oxen at work in the fields will sometimes betake themselves to flight with the plough at their heels, regardless of their driver or of the incumbrance which they drag behind them.

The formidable enemy that causes this alarm, and seems to inflict so much torture, is the *Æstrus Bovis*, the Breeze or Gad-fly, which at this time is seeking a habitation for its future young, and selects the hides of cattle for this purpose. It is said to choose the younger beasts, and those that are in highest condition. There has evidently been considerable exercise of selection, for a great many of the cattle in the same pasture will have only a few warbles on their backs, while others will, in a manner, be covered by them.

Naturalists and agriculturists are indebted to Mr. Bracy Clark for a very accurate account of this fly; and the author acknowledges his obligations to this celebrated veterinarian, and more particularly to that excellent French entomologist, M. Reaumur, for much of that which he is enabled to offer respecting the history of this insect.

The *æstrus bovis* is the largest and most beautiful of this genus. Its head is white, and covered with soft down—its thorax yellow anteriorly, with four black longitudinal lines—the centre of the thorax is black, and the posterior part of an ashen colour—the abdomen is also of an ashen colour, with a white black band in the centre, and covered posteriorly with yellow hair. It does not leave its chrysalis state until late in the summer, and is then eagerly employed in providing a habitation for its future progeny. It selects the back of the ox, at no great distance from the spine on either side, and alighting there it speedily pierces the integument,

deposits an egg in the cellular substance beneath it, and probably a small quantity of some acid, which speedily produces a little tumour on the part, and accounts for the apparent suffering of the animal*.

The egg seems to be hatched before the wound is closed, and the larva, or maggot, occupies a small cyst or cell beneath it. The tail of the larva projects into this opening, and the insect is thus supplied with air, the principal air-vessels being placed posteriorly; while with the mouth, deep at the bottom of the abscess, it receives the pus, or other matter that is secreted there. A fluid, resembling pus, can always be squeezed from the tumour, and increasing in quantity as the animal approaches his change of form. In its early stage of existence the larva is white, like that of most other flies; but as it approaches its maturity, it becomes darker, and at length almost black. These little tumours form the residence of the larva, and are recognised by the name of *warbles*.

The abscess having been once formed, appears to be of little or no inconvenience to the beast on whose back it is found. It certainly does not interfere with his condition†, and the butcher regards the existence of these warbles even as a proof of a disposition to thrive. The injury to the skin, however, is another affair, and the tanner would probably tell a different story. The larva, if undisturbed, continues in this cyst, until the month of June or July in the following year, and then forces itself through the aperture already described, and the accomplishment of which occupies two days. It is soft when it first escapes, but it soon hardens; and if it is fortunate enough to escape the birds which are on the look-out for it, or if it does not fall into the water, which the cattle seem now instinctively to seek, as it were to destroy as many of their enemies as possible, it conceals itself in the nearest hiding-place it can find, where it remains motionless until it changes to a chrysalis, which is speedily effected; it continues in its new form about six weeks, and then bursts from its shell a perfect fly.

It is a very singular circumstance, that the escape of the larva from its prison on the back of the ox always takes place in the morning, and between six and eight o'clock. Is the mysterious principle of instinct already at work? Does the maggot know, that if it forced itself through the hole in the warble at a later period, the heat of the sun would destroy it; or that if it fell during the night, it would perish before it could reach a place of refuge?

Being also exposed to many dangers in its chrysaline state, it is then covered with a scaly box of great strength, and from which it would seem impossible for it ever to make its escape; but when its change is complete, and it begins to struggle within its prison, a valve at one end of its narrow house, and fastened only by a slight filament, flies open, and the insect wings its way, first to find its mate, and then to deposit its eggs on the cattle in the nearest pastures.

Some farmers are very careless about the existence of these warbles; others very properly endeavour to destroy the grub that inhabits them.

* The weapon by means of which the perforation is effected is a very singular one. It seems to be formed of three different pieces, inclosed the one within an other, like the divisions of a telescope, and from the farthest and smallest the true auger, or perforator, proceeds.

† In 1823 and 1824, however, the *cœstri* were so numerous in the department of Loiret, in France, and the tumours accumulated to that extent on the cattle, that they occasioned fever, inflammation, and death. There was a disposition to inflammatory fever prevailing at the same time amongst most species of domesticated animals.—Rapport à la Société Royale et Centrale d'Agriculture, 1826.

This is effected in various ways—a little corrosive liquor is poured into the hole, or a red-hot needle introduced, or the larva is crushed or forced out by pressure with the finger and thumb. Although the existence of the warble is a kind of proof of the health and condition of the animal, yet there is no reason why the best beasts should be tormented by the gad-fly, or the strongest and best hides be perforated, and, in a manner, spoiled in their best parts. Although when the larva escapes or is expelled, the tumour soon subsides, the holes made are scarcely filled up during that season; and even a twelvemonth afterwards, a weakness of the hide, and disposition to crack, will show where the bot has been. If all farmers could be induced to search for and destroy the insect when a larva, the cattle of that district might be nearly or quite freed from this pest.

ANGLE-BERRIES, OR WARTS.

Cattle are subject to various excrescences growing from the cuticle at first, but afterwards identified with the true skin. They assume many forms, from that of scales of greater or less thickness, and accompanied sometimes by chaps and sores, to fungous growths, of different size and hardness, and bearing the character of warts. They are occasionally very numerous and exceedingly troublesome; and they are most numerous and exceedingly troublesome about the teats. When they grow about the eyelids they are a sad nuisance to the beast.

When there are only exfoliations and scales of the cuticle, friction with camphorated oil will occasionally remove them. It has been known to disperse the warty excrescences. Mercurial preparations, whether blue ointment, or corrosive sublimate and soap, are dangerous, but they will usually get rid of the angle-berries. When they are numerous, and particularly about the udder, the practitioner will probably try to remove the largest of them by means of a ligature passed round their roots. This, however, will often be an almost endless affair, and recourse must be had to the knife and the cautery. The cautery will stop the bleeding, destroy the root of the wart, and thus prevent its springing again. When they are small, this will be most successfully attacked by means of the nitrate of silver, the warts being touched daily with it in a solid form, if they are few and distinct; or washed with a strong solution of it, if they are more numerous and scattered over a large surface. They have been attributed to various causes, as contusions, stings of insects, want of condition, inflammation of the skin; but in most cases the actual cause is unknown.

A singular case of the periodical appearance of warts occurred in the author's practice. At uncertain intervals, from six to nine, or ten months, a cow suddenly lost flesh, her coat stared, she would scarcely eat, and at length, rumination was entirely suspended; then would appear, and nearly all over her, and particularly about the udder and in the mouth, and on the eyelids, a thick crop of warts, varying from the size of a millet-seed to twice that bulk. She was well physicked, and mashes were given to her—she recovered her appetite and spirits, the warts began to diminish, and in a fortnight they were gone.

Mr. Starks of Westwoodside, Lanark, relates a somewhat similar case. He had a cow mostly of a white colour with some black spots. She became ill from being over heated as Mr. Starks supposed—her appetite failed—she yielded no milk—she became exceedingly weak, and her eyes sunk in their sockets—the pulse was sixty—the skin warm—the extremities cold. She soon became hide-bound, and her skin was strangely hard.

She was bled and purged, and sulphur was given daily as an alterative, and she was well rubbed with oil in order to soften the skin. In a little while the cuticle, or outer layer of the skin, began to separate from the cutis or true skin beneath; the hair separated along with it, until from the mouth to the tail, and half-way down the legs, there was not a particle of hair remaining, except where there had been a spot of black, and on that place it continued quite soft and healthy. From the moment of the falling of the hair, the cow began to get better, and speedily recovered her appetite, and yielded her usual quantity of milk; the hair likewise, was by degrees reproduced on every part but the shoulders*.

CHAPTER XX.

A LIST OF THE MEDICINES USED IN THE TREATMENT OF THE DISEASES OF CATTLE.

IN the present imperfect state of the knowledge of the diseases of cattle and their remedial treatment, it may be supposed that many gross errors are committed—many inert or injurious medicines administered—many complaints aggravated, and thousands of animals lost. The pharmacopœia of the cow-leech does not indeed contain a numerous list of drugs, but a considerable proportion of them are either useless or dangerous, or administered in ineffectual or destructive doses. It is not, however, the object of the editor of this work to draw up a catalogue of errors and abuses in cattle-practice, although he might easily present one, ridiculous and disgusting to an almost inconceivable degree; but to describe the properties, and doses, and combinations of those medicines which the experience of rational practitioners in former times, and the inquiries of scientific men in these later years of veterinary improvement, have sanctioned.

ALCOHOL.—There are two circumstances which not only render the practice of giving stimulants to cattle far more excusable than in the horse, but absolutely necessary: the first is the disposition which all the inflammatory diseases of cattle have to take on a typhoid form, and assume a malignant character;—and the second is, the construction of the stomachs of these animals, in consequence of which a considerable portion of the medicine falls into the comparatively insensible paunch. Hence, inflammation having been subdued, the practitioner is always anxious to support the strength of the constitution; and even while he is combating inflammation he cautiously adds a stimulant to the purgative, in order that he may dispose the tissues with which that purgative may come into contact to be affected by it. Hence ginger forms an indispensable ingredient in every aperient drink; hence the recourse to wine in many cases of low fever; and hence also the foundation of, and the excuse for, the custom of adding the sound home-brewed ale to almost every purgative, and especially for young and weakly cattle, when evident inflammatory action does not forbid it. The fiery spices and the almost undiluted spirit administered by the cow-leech can never be justified; yet, in cattle-practice, the beneficial effect of the aperient often depends fully as much on the carminative by which it is accompanied, as on the purgative power of the drug itself.

* Veterinarian, Feb. 1834, p. 97.

ALOES.—This is the best, and almost the only purgative on which dependence can be placed in the treatment of the horse; but it holds a secondary rank, or might be almost dismissed from the list of cattle-aperients. It is always uncertain in its effect, and sometimes appears to be absolutely inert. Six ounces have been given without producing any appreciable effect; and, in another case, a similar dose was given, which was followed by considerable irritation and fever, but it did not purge. The animal was destroyed on the following day, in order to ascertain how far this apparent inertness might be attributed to that state of the œsophagean canal in which the greater part of the medicines administered enters the rumen, and being detained there cannot possibly produce its destined effect. A very small quantity of the drug was found in that stomach. Still, however, as there is no case on record in which it has destroyed the ox by superpurgation, as it too often has the horse, and as occasionally it does seem to exert some purgative effect, it may be admitted in combination with, or alternating with other purgatives when constipation is obstinate: few, however, would think of resorting to it in the first instance.

The Barbadoes Aloes should be selected, for the horse; and on account of the construction of the stomachs of ruminants, it must be always administered in solution, for a ball would break through the floor of the œsophagean canal and be lost in the rumen. Two ounces of aloes, and one ounce of gum-arabic (in order to suspend the imperfectly-dissolved portion of the aloes) should be put into a pint of boiling water, and the mixture frequently stirred during the first day; then two ounces of tincture of ginger are to be added, not only to prevent the mixture from fermenting, but because that aromatic seems to be so useful, and in a manner indispensable in cattle purgatives. The dose should consist of from half-a-pint to a pint of the solution, or from four to seven or eight drachms of the aloes. Some persons boil the aloes in the water, but the purgative effect of the drug is much lessened by this.

Aloes are very useful in the form of tincture. Eight ounces of powdered aloes and one ounce of powdered myrrh should be put into two quarts of rectified spirit, diluted with an equal quantity of water. The mixture should be daily well shaken for a fortnight, when it will be fit for use. It is one of the best applications for recent wounds; and in old wounds especially, accompanied by any foulness of them, or discharge of foetid pus, nothing will be more serviceable than equal parts of this tincture and a solution of the chloride of lime.

ALTERATIVES.—These are medicines that are supposed to have a slow yet beneficial effect in altering some diseased action of the vessels of the skin or of the organs of circulation or digestion. To a cow with yellows, or mange, or that cannot be made to acquire condition, or where the milk is diminishing, small quantities of medicine are often administered under the tempting, but deceptive, term of *alteratives*. They had much better be let alone in the majority of cases. If a cow is really ill, let her be treated accordingly; let her be bled or physicked, or both; but let her not be nauseated, or her constitution ruined, by continually dosing her with various drugs. The want of condition and thriving in cattle is far more connected with a diseased state of their complicated stomachs, and particularly with obstruction in the manyplus, than with any other cause; the alteratives, then, should be small quantities of purgatives, with aromatics, as Epsom salt, or sulphur with ginger; or, what would be still preferable, rock salt in the manger for them to lick, or common salt mingled with their food. There can, however, be no doubt that in many cutaneous affections, and especially where mange is suspected, alterative medicines will be very

beneficial. They should be composed of Æthiop's mineral, nitre, and sulphur, in the proportions of one, two, and four, and in daily doses of from half an ounce to an ounce.

ALUM.—This is a useful astringent in diarrhœa, and especially in the purging of calves. It is best administered in the form of alum whey, which is composed of two drachms of powdered alum, dissolved in a pint of hot milk; a drachm of ginger may be added; and, if the purging is violent, a scruple of opium. Alum is rarely used externally in the treatment of cattle, unless for canker in the mouth, and as a useful wash after the tongue has been lanced in blain; and unless in the form just mentioned, the less it is used internally the better.

AMMONIA is not frequently used. In the form of hartshorn it enters into the composition of some stimulating liniments, as in cases of palsy. The carbonate of ammonia has been extolled as a specific for hoove. The author always doubted this; he put it to the test, and it failed. It was administered on a chemical principle, it being supposed that the alkali would neutralise the acid gas that was extricated from the fermenting food; but it has been proved that this gas consists chiefly either of carburetted or sulphuretted hydrogen: besides which there is another consideration, that, except administered by means of Read's pump, not one drop of the ammonia would find its way into the paunch.

ANODYNES.—The only one used in cattle-practice is opium. The doses in which it may be employed have already been pointed out when treating of the diseases in which it is indicated.

ANTIMONY.—There are but three preparations of it that can be useful to the practitioner on cattle. The first is

EMETIC TARTAR, which, in doses from half a drachm to a drachm, and combined with nitre and digitalis, has great efficacy in lowering the circulation of the blood in inflammation of the lungs and every catarrhal affection, and particularly in that species of pleurisy to which cattle are so subject. Emetic tartar, rubbed down with lard, constitutes a powerful and very useful stimulant when applied to the skin.

ANTIMONIAL POWDER—the powder of oxide of antimony with phosphate of lime. It is frequently sold in the shops under the name of James's Powder, and possesses all the properties of that more expensive drug. It is a useful febrifuge in cases where it may not be advisable to nauseate the beast to too great a degree.

CHLORIDE (BUTYR) OF ANTIMONY.—Where it is wished that a caustic shall act only superficially, this is the most useful one that can be employed. It has a strong affinity for water, and therefore readily combines with the fluids belonging to the part to which it is applied, and so becomes diluted and comparatively powerless, and incapable of producing any deep and corroding mischief. It has also the advantage, that, by the change of colour which it produces, it accurately marks the extent of its action, and therefore forms an unerring guide to the surgeon. For warts, foul in the foot, cankered foot, and for some indolent and unhealthy wounds, it is a valuable caustic and stimulant.

ANTISPASMODICS.—Opium, for its general power, and particularly for its efficacy in locked jaw, stands unrivalled. The spirits of turpentine and nitrous ether are useful in cases of colic.

ASTRINGENTS.—These are few in number, but they are powerful: alum, catechu, opium (an astringent because it is an anodyne) and blue vitriol comprise the list: the first used both externally and internally; the two next internally; and the last internally, but chiefly powerful as arresting nasal discharge.

BLISTERS.—The thickness of the skin of cattle renders it somewhat difficult to produce any great degree of vesication. The part should be previously fomented with hot-water, then thoroughly dried, and the blistering application well rubbed in. With these precautions the common blister ointment will act very fairly; the turpentine tincture of cantharides still better; while an ointment composed by triturating one drachm of emetic tartar with six of lard will produce more powerful and deeper irritation, but not so much actual blistering. Sometimes boiling water, and in a few cases, and especially in bony enlargements about the legs attended by much lameness, the hot iron will be resorted to.

CALAMINE.—See **ZINC**.

CALOMBO.—A very useful tonic, and especially in those cases of debility which accompany or follow dysentery. It should be given in doses of from one to three drachms, combined with ginger.

CALOMEL.—See **MERCURY**.

CAMPHOR.—Used externally alone in cattle-practice. It is a component part in the liniments for palsy and garget.

CANTHARIDES.—the principal ingredient in all blistering ointments, and to which they owe their power. Corrosive sublimate, sulphuric acid, and euphorbium, may increase the torture of the animal, but they will generally blemish, and often lay the foundation for deep and corroding ulcers. The best blister ointment for cattle is composed of one part of cantharides (Spanish flies) finely powdered, three of lard, and one of yellow resin; the lard and the resin should be melted together, and the flies added when these ingredients begin to cool.

CARRAWAYS.—The powder of these seeds may be used as an occasional change for ginger; yet it is not so stomachic as the ginger, and is decidedly inferior to it, except in cases of flatulent colic. It may be given in doses, from half an ounce to two ounces.

CASTOR OIL.—An effectual and safe purgative for cattle in doses from twelve ounces to a pint, and that will be properly employed when Epsom salt or other aperient drugs have not produced their desired effect. It is usually made into a kind of emulsion with the yolk of an egg. It is however to be doubted whether it is much superior to a less expensive purgative, the linseed-oil.

CATECHU is an extract from the wood of one of the acacia trees. It is much less expensive than the Gum Kino, and it is, when unadulterated, more effectual than that gum in subduing the diarrhoea of calves or adult cattle. The quantity, and the drugs with which it should be combined, have been stated in p. 476.

CAUSTICS.—In the treatment of foul in the foot, these are indispensable, and the chloride (butyr) of antimony has no rival in the certainty with which it destroys the fungus or otherwise unhealthy surface to which it is applied, and the equal certainty of its destructive power being confined to the surface. For warts, angle-berries, &c., externally situated, the nitrate of silver in substance, or in the form of a strong solution, will be most effectual; for canker in the mouth, barbs, and paps, a strong solution of alum will be as useful as any thing; and in order to stimulate indolent and unhealthy ulcers, nothing can compare with the diluted nitric acid.

CHALK.—See **LIME**.

CHAMOMILE.—If it were necessary to add another tonic to the gentian and calombo it would be the chamomile, and on the principle of not being so powerful as either of the others, and therefore used in somewhat doubtful cases, when, if the state of fever has not quite passed over, a stronger stimulant might have been prejudicial.

CHARGES.—These are thick adhesive plasters spread over parts that have been strained or weakened, or that are affected with rheumatism, and which, being applied warm, mingle so with the hair, that they cannot be separated for a long time afterwards. They give a permanent support to the part, and likewise exert a gentle but constant stimulating power. Old cows, weakened and rendered almost useless by a rheumatic affection of the loins, which is degenerating into palsy, often derive much benefit from the application of a charge. It is also useful when the joints are the seat of rheumatic lameness.

CLYSTERS.—The importance of the administration of injections has not yet been sufficiently acknowledged in cattle-practice. A recurrence to the account which has been given of the lower or larger intestines of cattle, and which, although long, are not capacious compared with those of the horse, and whose surface is not irregular and cellated as in that animal, but perfectly smooth, so that a fluid will readily pass along them and to their full extent, will show the propriety of having frequent recourse to this mode of administering medicine. A soothing and emollient injection may be brought into contact with the inflamed and irritable surface of these intestines; or, on the other hand, that surface may be extensively and beneficially stimulated by the direct application of purgative medicine. The former is a most important consideration in diarrhœa and dysentery; and the latter is not of less moment when the comparative insensibility of the three first stomachs of cattle is regarded. Much may be done by means of the bladder and pipe, but the newly-invented stomach and enema-pump of Read enables the practitioner to derive from injections all the advantages that can be connected with their administration.

COPPER.—There are but two compounds of this metal that have any value in cattle-practice, and they are the **BLUE VITRIOL**, or sulphate of copper, and **VERDIGRIS**, or acetate of copper. The use of the first is limited to the coryza, or inflammation of and defluxion from the nose in cattle, accompanied by little or no cough or fever, and which is sometimes in a manner epidemic. The manner of administering it is described in p. 313. As a caustic the blue vitriol is altogether superseded by those mentioned under that head.

VERDIGRIS is employed externally only, in one of the varieties of foul in the foot, in order to repress fungous growths. It is mixed with an equal portion of the sugar of lead, reduced to a fine powder and sprinkled on the diseased surface.

CORDIALS.—These are destructively abused by many cow-leeches, but, as has been again and again stated, there is that in the structure and constitution of cattle, which will excuse their administration much oftener than in the horse. Except in extreme cases, and when their use is sanctioned by the decision of a competent veterinary practitioner, they should not extend beyond good home-brewed ale, and ginger and carraways; or, perhaps, because the farmer will seldom believe that a drink for a cow can be good for anything unless it stinks of aniseed, a few drops of the oil of those seeds may be allowed. The bay berries, and cardamom seeds, and coriander seeds, and cummin seeds, and diapente, and elecampane, and fennel seeds, and fenugreek seeds, and grains of paradise, and juniper berries, and horse-spice, and pepper, and various other pungent aromatics that encumber the shelves and load the drinks of him of the old school, should be banished from the pharmacopœia of the rational practitioner of cattle-medicine.

CORROSIVE SUBLIMATE.—See **MERCURY**.

CROTON SEEDS.—These can scarcely be admitted into practice on ordinary occasions, or as a usual purgative; but in cases of phrenitis, tetanus, inflammatory fever, and in those strange constipations which so often puzzle and annoy, the croton seed, in doses of from ten to sixteen grains, may be allowed. The bowels having been opened, the practitioner will keep up the purgative action by means of a milder and safer aperient. The seeds should be kept in a close bottle, and when wanted, should be deprived of their shells, and pounded for use. The farina soon loses its power, and the oil is shamefully adulterated.

DIAPHORETICS.—The thick hide of the ox forbids us to expect much advantage from those drugs which are supposed to have their principal influence determined to the skin, and thus to increase the sensible and insensible perspiration; yet emetic tartar and sulphur are, to a considerable extent, valuable in cases of fever—and the latter most certainly in cutaneous eruption and mange, by opening the pores of the skin, or exciting its vessels to healthy action. One, however, of the best diaphoretics is that which has been comparatively lately introduced in the general management of cattle, viz., friction applied to the skin. It needs but the slightest observation to be convinced that the health of the stall-fed beast, and his thriving and getting into condition, are materially promoted by the liberal use of the brush, and sometimes even of the curry-comb.

DIGITALIS (FOXGLOVE).—The leaves of this plant, gathered about the flowering season, dried, kept in the dark, and powdered when wanted, are most valuable in diminishing the frequency of the pulse, and the general irritability of the system in cattle. A reference to the treatment of almost every febrile disease will illustrate this. The dose is from half a drachm to a drachm, with emetic tartar, nitre and sulphur, and administered twice or thrice in the day, according to the urgency of the case. The practitioner must not be alarmed at the intermittent pulse which is produced. It is by means of certain pauses and intermissions in the action of the heart, that the rapidity of the circulation is diminished when this drug is exhibited. The intermittent pulse is that which the practitioner will be anxious to obtain, and which he will generally regard as the harbinger of returning health.

DIURETICS.—These fortunately are not so much used in cattle-practice as in that of the horse; they are, however, allowable and beneficial in swelled legs, foul in the foot, and all dropsical affections, while they advantageously alternate with other medicines in the treatment of mange, and all cutaneous affections, and in cases of mild or chronic fever. Nitre and liquid turpentine are the best diuretics, and almost the only ones on which dependence can be placed. The doses have been already pointed out.

DRINKS.—It is needless again to explain the reason why all medicines that cannot be concealed in the food must be administered to cattle in the form of DRINKS. If they are exhibited in a solid form, they will break through the floor of the œsophagean canal, and enter the rumen. Farriers and cow-leeches, however, often give to their drinks the force and momentum of a ball, by the large vessels from which they are poured all at once down the throat. There are few things of more consequence than attention to the manner in which a drink is administered.

ELDER.—The leaf of this tree is used boiled in lard. It forms one of the most soothing and suppling ointments that can be applied. The practitioner should make his own elder ointment, for he will often receive from the druggist an irritating unguent formed of lard coloured with verdigris, instead of the emollient one furnished by the elder.

EPSOM SALT.—See MAGNESIA.

FOMENTATIONS.—If, owing to the greater thickness of the skin, these are not quite so effectual in cattle as in the horse, yet, as opening the pores of the skin and promoting perspiration in the part, and thus abating local swellings, and relieving pain, and lessening inflammation, they are often exceedingly serviceable. The practitioner may use the decoction of what herbs he pleases, but the chief virtue of the fomentation depends on the warmth of the water.

GENTIAN.—An excellent stomachic and tonic, whether at the close of illness, or as a remedy for chronic debility. Its dose varies from one to four drachms, and should be almost invariably combined with ginger.

GINGER.—The very best aromatic in the list of cordials for cattle, and with the exception of carraways, superseding all the rest. The dose will vary from half a drachm to four drachms.

GOULARD'S EXTRACT.—See **LEAD.**

HELLEBORE, BLACK.—The root of it forms an excellent seton when passed through the dew-lap; it produces plenty of swelling and discharge, and rarely or never runs on to gangrene.

IODINE.—The use of this mineral is limited to a few cases, but there its effect is truly admirable. It will scarcely ever fail of dispersing enlargements of the glands, or hardened tumours, whether under or at the side of the jaw, or round the joints. One part of hydriodate of potash must be triturated with seven parts of lard, and the ointment daily and well rubbed on and round the part. Indurations of the udder seldom resist its power, unless the ulcerative process has already commenced.

There is a still more important use to which this drug may be applied. It possesses some power to arrest the growth of tubercles in the lungs, and even to disperse them when recently formed. It is only since the former part of this work was written that the attention of the author has been so strongly directed to this property of iodine, and that he has had such extensive opportunities of putting it to the test. He will not say that he has discovered a specific for phthisis or consumption in cattle, but he has saved some that would otherwise have perished, and, for awhile, prolonged the existence and somewhat restored the condition of more. He would urge the proprietor of cattle, and more especially his fellow-practitioners, to study closely the symptoms of phthisis, as detailed in page 410; to make themselves masters of the inward, feeble, painful, hoarse, gurgling cough of consumption; and as soon as they are assured that this termination, or consequence of catarrh, or pneumonia, or pleurisy, begins to have existence—that tubercles have been formed, and, perhaps, have begun to suppurate, let them have recourse to the iodine, in the form of the hydriodate of potash, given in a small mash in doses of three grains morning and evening at the commencement of the treatment, and gradually increased to six or eight grains. To this should be added proper attention to comfort, yet not too much nursing; and free access to succulent, but not stimulating food; and the medicine should be continued not only until the general condition of the beast begins to improve, but until the character of the cough has been essentially changed.

IPECACUANHA.—This drug is used in the composition of the Dover's, or compound ipecacuanha powder, which has been recommended by some practitioners in the treatment of dysentery. It is thus made—'Take ipecacuanha root powdered, and opium also in powder, of each a drachm, and sulphate of potash an ounce. Rub them together to a fine powder.' The dose is from two to four drachms. This, however, is not an efficient medicine for such a disease.

LARD.—This is the principal basis of all ointments.

LAUDANUM.—See **OPIUM**

LEAD, SUGAR OF—(**SUPERACETATE OF LEAD.**)—This, mixed with the subacetate of copper (verdigris, which see), forms a useful caustic for the destruction of fungous growths.

GOULARD'S EXTRACT—(**LIQUOR PLUMBI SUPERACETATIS.**)—When the skin is unbroken, this preparation of lead is completely thrown away, whether used either as a lotion to subdue inflammation, or to disperse tumours or effusions. It is principally serviceable, applied in a very dilute form, to abate inflammation of the eye.

WHITE LEAD (**SUBCARBONAS PLUMBI**) is the basis of a cooling, drying ointment, used chiefly for excoriations, or superficial wounds.

LIME. CARBONATE OF LIME, CHALK.—This is a useful ingredient in all the drinks given in diarrhœa or dysentery. In every stage of these diseases there is a tendency in the fourth stomach, and perhaps in the intestines, to generate a considerable quantity of acid, than which a greater source of irritation can scarcely be imagined. The chalk, or the alkali of the chalk, will unite with this acid, and neutralize it, and render it harmless. In the diarrhœa of the calf it is absolutely indispensable, for there the acid principle is frequently developed to a great degree. The dose will vary from a drachm to an ounce.

CHLORIDE OF LIME.—The list of medicines for cattle does not contain anything more valuable than this. As a disinfectant,—if the walls, the floor, and the furniture of the cow-house or stable, are twice or thrice well washed with it, the sound cattle may return to the building with perfect safety, however contagious may have been the disease of those that had previously perished there. Applied to the pudenda of the cow that has aborted, it destroys that peculiar smell which causes abortion in others, more readily than any preparation of the most powerful or nauseous ingredient. In blain, garget, foul in the foot, and sloughing ulcers of every description, it removes the fœtor; and, if the process of decomposition has not proceeded too far, gives a healthy surface to the ulcers which nothing else could bring about;—and, administered internally in blain, in the malignant epidemic, and in diarrhœa and dysentery, it is of essential service. In the last disease it is particularly beneficial in changing the nature of the intestinal discharge, and depriving it of its putridity and infection, and disposing the surface of the intestine to take on a more healthy character. Half an ounce of the powder, dissolved in a gallon of water, will give a solution of sufficient strength, both as a disinfectant applied to the cow-house, and for external and internal use as it regards the animal.

LINSEED.—Nothing can compare with the linseed meal as an emollient poultice—if the ulcer is foul, a little of the chloride of lime should be mixed with it. If the object of the poultice is to bring an ulcer into a proper state of suppuration, a little common turpentine may be added; but the cruelly-torturing caustics of the cow-leech and the farrier should never disgrace the regular practitioner.

An excellent mash in cases of catarrh or sore-throat, and as an emollient in any intestinal affection, is made by adding bran to an infusion of linseed.

LINSEED OIL.—This is little inferior to castor-oil as a purgative; it is much cheaper, and it is equally safe. Where the case seems to indicate an oily purgative, and the first dose of castor-oil fails, it may be followed up by smaller doses of linseed-oil, until the desired effect is produced.

MAGNESIA, SULPHATE OF. EPSOM SALT.—This may be regarded as

the staple purgative of cattle. It is as safe as Glauber's salt; it is more certain, and it will dissolve in one-third of the quantity of water. The first dose of physic should always consist of the Epsom salt, quickened in its action, in extreme cases, by the farina of the croton-nut; the purgative effect may be kept up by means of sulphur or Epsom salt, in doses of six ounces of the former, or eight of the latter, as the state of the animal may appear to require. The medium dose is about a pound, with a quarter of an ounce of ginger, but a pound and a half may be given to a large beast without the slightest danger.

MASHES are very useful in cattle-practice, not so much to prepare for physic, or to get into condition, as to form a soothing and cooling substitute, when the case requires a temporary abstinence from dry and stimulating food. They may be composed, like those of the horse, of bran only, with hot or cold water; or of bran with a decoction of linseed. In cases of debility, steeped or ground oats may be mixed with the bran, or malt may be used as a substitute for the bran and oats.

MERCURY. MERCURIAL OINTMENT.—The practitioner should be very cautious in his use of this on cattle. Indeed, it is scarcely allowable except in a very diluted state, and with the common sulphur ointment, in bad cases of mange; or a small quantity of it may be mixed with lard for the destruction of vermin.

SULPHATE OF MERCURY, ÆTHIOP'S MINERAL.—A very useful alterative combined with sulphur and nitre, where there is any cutaneous affection. The circumstances under which it may be administered, and the doses, will be found in various parts of this work.

PROTO-CHLORIDE OF MERCURY. CALOMEL.—This should rarely be given to cattle, and never as a purgative. In chronic inflammation of the liver, it often has a decidedly injurious effect: in jaundice, caused by a gall-stone obstructing the biliary ducts, or in that of a more chronic nature accompanied by debility and declining condition, the experience of the writer will not warrant him in recommending the administration of calomel: he would, on the contrary, be disposed to confine its use to dysentery, in which, combined with and guarded by opium, irritation is allayed, while the natural action of the bowels is promoted.

BICHLORIDE OF MERCURY. CORROSIVE SUBLIMATE.—This drug may almost be dispensed with by the practitioner on cattle. It can never be administered internally; it is highly dangerous used externally in considerable or efficient quantity for the cure of mange or any cutaneous eruption, and as a caustic there are many as good.

MINT.—An infusion or decoction of this plant will be a useful vehicle in which other medicines may be administered for the cure of diarrhoea or colic.

MYRRH.—The tincture of myrrh is a useful application to wounds, and is also applied to the cankered mouth; but it contains nothing to render it preferable to the tincture of aloes in the former case, or a solution of alum in the latter.

NITRE.—See POTASH

NITROUS ETHER, SPIRIT OF.—A favourite medicine with many practitioners in the advanced stages of fever. It is said to rouse, to a certain degree, the exhausted powers of the animal, while it rarely brings back the dangerous febrile action that was subsiding. It is not, however, a stimulant to which the author has often dared to have recourse, except in the advanced stages of epidemic catarrh, or the malignant epidemic. The dose should not exceed half an ounce.

NUX VOMICA.—This is not introduced from any experience which the author has had of its efficacy, but from the favourable opinion which some

continental veterinarians have expressed of it in the cure of palsy. The doses which they gave consisted of more than an ounce. The author has tried the *nux vomica*, and its essential principle, the strychnine, as a cure for palsy in the dog, but never with success.

OPIUM.—As an anti-spasmodic, an allayer of irritation, and an astringent because it does allay irritation, opium stands unrivalled. It is that on which the chief, or almost the only dependence is placed in locked jaw. A choleric drink would lose the greater part of its efficacy without it; and if it were left out of the medicines for diarrhœa and dysentery, almost every other drug would be administered in vain. It is most conveniently given in the form of powder, and held in suspension with other medicines in thick gruel.

The tincture of opium (*laudanum*) is useful in inflammation of the eyes; and a poultice of linseed meal made with a decoction of poppy-heads often has admirable effect when applied to irritable ulcers, or to parts labouring under much inflammation.

PITCH.—This is only useful as the principal ingredient in charges, so useful in cases of palsy, or sprain, or chronic local debility.

POTASH, NITRATE OF. NITRE.—As useful to cattle as to the horse. It has an immediate effect in abating inflammation, and it is a mild diuretic. The dose would vary from two to four drachms. When dissolved in water it much lowers the temperature of that fluid, and therefore the solution, applied immediately after it is made, forms an excellent application in cases of sprains, or where there is much superficial inflammation without any lesion of the skin. Combined with antimonial powder, or emetic tartar and *digitalis*, it forms an almost indispensable ingredient in every fever drink.

SULPHATE OF POTASH.—An ingredient in the Dover's powder.

POULTICES.—These are justly valued for abating inflammation, cleansing wounds, and disposing them to heal. In some cases of foul in the foot, and especially in that most painful, and occasionally fatal variety whose immediate seat is at the division of the pasterns, also in ulcers about the throat or joints, and in garget, poultices can scarcely be dispensed with. The basis will generally be linseed meal, rendered even more soothing by opium; or to which activity may be given by the addition of common turpentine or chloride of lime.

RYE, ERGOT OF.—The spurred rye has lately, and with considerable advantage, been introduced into veterinary practice in protracted or difficult parturition, in order to stimulate the uterus to renewed and increased action, when the labour pains appeared to be subsiding. For the testimony in favour of and against the ergot, the reader is referred to p. 535 of this work.

SETONS.—The use of setons in practice on the diseases of cattle is in a manner limited to the passing of a piece of hair, rupe, or of black hellebore root through the dewlap; and, as exciting inflammation in the neighbourhood of the diseased part, and thus lessening the original one, and causing a determination of blood to a greater or less extent to this new seat of irritation, they are useful both in acute and chronic inflammation of the respiratory organs. In young cattle rapidly thriving, and placed in pasture perhaps a little too luxuriant, permanent setons are highly beneficial. They act as a salutary drain, and prevent that accumulation of the circulating fluid, which is the usual cause of inflammatory fever and other fatal complaints.

SULPHATE OF SODA, GLAUBER'S SALT.—A very common purgative for cattle, and a very good one, but inconvenient on account of its requiring three times its weight of water in order to dissolve it, and also on account

of its so readily efflorescing when it is exposed to the atmosphere, and, in its state of efflorescence or powder, becoming more purgative than when in its crystalline form. The practitioner sometimes finds it a little difficult to calculate the amount of the dose which he should give, on account of this variation in form and effect; and this may explain the occasional uncertainty of the Glauber's salt. The Epsom salt, a very little dearer, dissolving in its own weight of water, and retaining the same form and the same purgative power under every state of the atmosphere or of exposure to it, is now rapidly superseding the Glauber's.

CHLORIDE OF SODIUM. COMMON SALT.—The experience of almost every farmer will now confirm the benefit derived from the mixture of salt with the food of cattle. It appears to be the natural and universal stimulus to the digestive organs of animated beings. In this place, however, its medicinal power alone is the subject of consideration. It is a purgative, second only to the Epsom salt in the first instance; and, whether from the effect of the change of medicine, or of some chemical composition or decomposition which takes place, it is the surest aperient that can be given when the Epsom salt has failed; but the writer does once more indignantly protest against the disgraceful, beastly menstruum in which it is frequently administered. It is a tonic as well as a purgative, and therefore perhaps somewhat objectionable in the early stage of fever. It frequently recalls the appetite more speedily than any stomachic. When a dose of it is given to the animal recovering from acute disease, debilitated, listless, careless about or refusing its food, it sometimes has an almost magical effect in creating a disposition to feed. It is a vermifuge which, in cattle, seldom fails.

SILVER, NITRATE OF. LUNAR CAUSTIC.—Used for the destruction of warts either in its solid state, or that of a strong solution; and, from the full command which the operator has over it, and the firm eschar which it forms, is the very best caustic that can be applied to a wound inflicted by the bite of a rabid dog.

SULPHUR.—A very good aperient when the object is merely to evacuate the bowels, or when there is any cutaneous affection; but not sufficiently powerful in cases of fever: yet even there purgation, once established, may be kept up by means of it. The dose varies from eight to twelve ounces. As an alterative for hide-bound, mange, or a generally unthrifty appearance, it is excellent combined with *Æthiop's* mineral and nitre; and it constitutes the basis of every ointment for the cure of mange.

TONICS.—These are indicated in cases of great, and especially of chronic debility, but, administered injudiciously, they have destroyed thousands of beasts. They have done so when they have been poured in while the fever continued, or too soon after the subsidence of the fever, and when too great a disposition to its reappearance prevailed. When disease has been once removed, the powers of nature are usually sufficient to re-establish health. Gentian, calombo, and cascarilla, are the best, and almost the only safe tonics for cattle.

TURMERIC, or coloured pea-flour, for it is seldom anything more, is fit only to give that yellow colour to cattle-medicines, which long usage has accustomed the cow-herd and the cow-leech to consider as indispensable.

TURPENTINE.—Several of the products of the fir tree are more or less useful in the medical treatment of cattle.

TAR, spread upon coarse cloth, is the best covering for broken horns, and excludes both the fly and the atmospheric air. It is useful for the same purpose in cases of wounds puncturing the belly or chest. Alone,

or in combination with some greasy matter, it is used to defend sore or diseased feet from becoming wet or bruised.

PITCH is the principal ingredient in charges.

COMMON LIQUID TURPENTINE is useful as a *digestive*, or to produce a healthy appearance or action in wounds, and dispose them to heal. For this purpose it is added to the linseed poultice or to the simple ointment. Some practitioners administer it as a diuretic, and with good effect.

OIL, or SPIRIT OF TURPENTINE, is applied as an external irritant, either alone, or in the form of a tincture of cantharides. It is administered internally in colic; and some give it in red-water with a view to cause the debilitated blood-vessels to contract, and thus arrest the passive hemorrhage which they imagine is then taking place. From the rapidity and great extent with which it is taken up by the absorbents, and carried into the circulation, and the destructive effect which it is known to have on intestinal worms when otherwise brought into contact with them, the trial of its power would be justified in bronchitis, the too frequent and fatal concomitant of which is the presence of thousands of worms in the air-passages.

RESIN is often used to give consistence to plasters, where the degree of irritation which it might produce is not regarded, or would be beneficial.

VINEGAR.—This used to be considered almost a specific in distention of the rumen with gas, but on what principle it would be difficult to explain. It has also been given with manifest impropriety in cases of fever. On the thick skin of the ox it can have little preference to hot water as a fomentation, and may with no great loss be erased from the list of medicines.

WAX.—Its only use is to give consistence to ointments and plasters.

ZINC. NATIVE CARBONATE OF CALAMINE.—This is the basis of an ointment which, from its soothing, and, at the same time, drying qualities, is termed, in various parts of this work, “the healing ointment.” It is useful in superficial wounds, and in deeper ones when they have been brought to a healthy character.

WHITE VITRIOL.—This is a useful tonic application to the eyes, when the inflammation has been subdued, and debility of the vessels alone remains. It is particularly useful after inflammation of the haw of the eye. Some administer it in red-water, and others in dysentery, very improperly. As a general caustic it is superseded by many others.

I N D E X .

- ABERDEENSHIRE** cattle, description of the, 103, 106
 ————, origin of the present breed of, 105
 ———— polled cattle, account of the, 106
Abomasum, the internal structure of, 423, 424, 426, 428
 ————, diseases of the, 455
Abortion, the symptoms of, 527
 ————, the usual causes of, 530
 ————, precautions to prevent the recurrence of, 532
Abyssinian cattle, enormous length of the horns of, 282
African ox, description of the, 4, 5
Age, the natural of cattle, 323
 ————, as indicated by the horns, 279
 ———— by the teeth, 318
 ————, the proper, for breeding, 526
Alderney cattle, account of them, 267
Allinson, Mr., his favourable opinion of the action of ergot of rye, 535
Althorp, Lord, description of his bull Firby, 241, 368, 371
 ————, cuts and description of his cow and heifer, 236, 237
Aloes, not a good purgative for cattle, 677
Alteratives, their nature, and the best composition of them, 578
Alum, the medicinal properties of, 678
Ammonia, the medicinal properties of, 579
Anglesey may be considered as the native country of the Welsh cattle, 59
 ———— cattle, description of, 61
 ————, comparison between them and the Scotch, 61
Angus cattle, description of the horned breed of, 113, 114
 ———— farmers, a curious description of them in 1760 and 1790, 113
 ———— polled cattle, 166
 ————, difference between them and the Galloways, 167, 169
 ————, Mr. Watson's breed, a very superior one, 167
 ————, curious anecdote respecting them, 171
Antimony, the medicinal properties of, 579
Antrim, the principal improvers of the breed of cattle in, 182
Apoplexy, symptoms and treatment of, 294, 296
Appetite, voracious, in oxen, curiously accounted for, 454
Argyleshire sheep-husbandry, first introduced by John Campbell, 78
 ————, North, description of the cattle and their management, 78, 79
 ————, South, the cattle of, 80
Arran, the great improvement effected there by the Duke of Hamilton, 74
 ————, description of the cattle, 75
Arteries, their structure and functions, 353
 ————, the smallness of, in the ox, compared with the veins, 346
Assynt, the breed of cattle in, 94
Astringents, the best for cattle, 574
Aylesbury, vale of, the fertility of, 214
Ayrshire cow, Mr. Aiton's description of her, 127
 ————, origin of, 128, 130
 ————, the present, 131
 ————, compared with the Alderney, Holderness, and Devon, 132
 ———— cow, the quantity of her milk, and the quantity of butter, 131, 132
BACKLEY, the African, interesting description of, 5
Badsworth, Mr. Milton's old bull, description of, 250
Bagot, Lord, a patron of the Staffordshire long-horns, 223
Bakewell, Mr., the great improver of the long-horns, 190
 ————, his supposed principles, as stated by Mr. Marshall, 191
 ————, description of his cattle, 192
 ————, his benevolent character, ib
 ————, the practice of letting bulls originated with him, 195
Banff cows, the superiority of, 101
Barbs in the mouth, treatment of, 337
Bars of the mouth, description of, ib.
Bedford, Francis, Duke of, used to be a zealous breeder of Devon cattle, 21
 ————, the Herefordshire cattle of the present Duke of, 211
Bedfordshire, the breeds of cattle in, 210
Belfast, the present state of cattle, 186
Berkeley, the vale of, history of the manufactory of cheese in, 37
Berkshire cattle, account of, 214
Berry, the Rev. H., his admirable account of the short-horns, 226
 ————, extracts from his Prize Essay on Breeding, 522, 525, 526
Berwickshire, the cradle of Scottish agriculture, 150
 ———— turnips, introduced there in 1755, 150
 ————, the rapid progress of agriculture after that, 151
Bile, the composition and uses of, 459, 469
Black quarter, the nature and treatment of, 356
Black water, the treatment of, 512
Bladder, inversion of the, 521
 ————, protrusion of, treatment of, 543

- Bladder, on rupture of the, 520
 —, stone in the, symptoms and treatment of, 518
 Blain, the symptoms and treatment of, 326
 —, contagious, 328
 —, sometimes epidemic, 327
 Bleeding, the rule by which it should be guided, 348
 — places, the preferable, *ib.*
 Blisters, the difficulty of raising them in cattle, 401
 Blood, determination of to the brain, 294
 Blown—See "Hoove."
 Bloxedge, the sire of the long-horns, an account of him, 190
 Bolinbroke, an early short-horn bull, an account of him, 230
 Bone of the heart, description of the, 353
 Booth's establishment for fattening cattle, account of, 255
 Boyening, description of, 132
 Brahmin cattle, an account of the, 269
 Brain, description of the, 285
 —, determination of blood to, 294
 —, inflammation of the, 269
 —, hydatids in the, 294
 Breast, the projecting and wide, advantage of, 14, 368
 — bone, description of the, 369
 Brecknockshire cattle, description of, 58
 Breeding, the principles of, 191, 522
 —, the grand principle of it, that like produces like, 522
 —, comparative influence of the sire and dam in, 523
 — in and in, 525
 —, the value of good keep in, *ib.*
 —, the proper age for, 526
 Bridgewater cheese, account of, 30
 Brisket, description of the, 370
 —, remarkable deepness of, in some cattle, *ib.*
 British cattle, earliest history of, 4
 —, the original were probably middle-horned, 9
 Bronchitis, nature and treatment of, 397
 —, the air-passages filled with worms in, 398
 Buchan cattle, description of the, 107
 —, calculation of the value of their produce, 109
 Buckinghamshire cattle, description of, 214
 Buffalo cattle, an account of, 269
 Bute, description of the cattle of, and their management, 77
 Butter, experiments to ascertain the various quantities of, from different breeds, 245
 —, extraordinary quantity of, yielded by a Sussex cow, 45
 CÆCUM, description of the, 467, 469
 Cæsarian operation, description of, and when justifiable, 539
 Caithness, description of the old cattle, 87
 —, the improvement effected there by Sir John Sinclair, 88
 —, present state of the cattle of, *ib.*
 —, markets and trysts of, 89
 Calamine, the basis of the best healing ointment, 588
 Calculi in the rumen of cattle, 435, 496
 — in the kidney, composition, symptoms, and treatment of, 516
 —, urinary, ditto, *ib.*
 Caledonian dairy, account of the, 146
 Calombo, a useful tonic, 579
 Calomel, the cases in which it should be used, 585
 Calves, diseases and management of, 557
 Calving, the treatment of the cow before it, 533
 —, natural, the treatment of, 535
 —, the power of ergot of rye in exciting the labour pains, *ib.*
 —, the management of unnatural presentations, 536
 —, when the calf should be cut away, and description of the operation, 540
 —, on retention of the foetus, 543
 —, attention to the cow after it, 544
 Cambridgeshire, the breeds of cattle in, 209
 — butter, account of, *ib.*
 Camphor, its medicinal properties, 580
 Cancer of the eye, treatment of, 293
 Cantharides, the basis of the best blister application, 580
 Capillary vessels, description of them, 353
 Cardiganshire cattle, description of, 57
 Carmarthenshire, the hill breed, an indifferent kind of cattle, *ib.*
 —, description of the different breeds of the vale districts, *ib.*
 Carnarvonshire cattle, a smaller and inferior variety of the Angleseys, 62
 Carotid artery, description of the, 335, 346
 Carraway, a useful aromatic, 580
 Castor oil, the use of it as a medicine, *ib.*
 Castration of calves, the various methods of, 560
 — will often remove rupture in the calf, 502
 Cataract, treatment of, 293
 Catarrh, nature and treatment of, 376
 —, the necessity of attention to it on its first appearance, 377
 —, epidemic, symptoms of, *ib.*
 Catechu, its useful astringent properties, 580
 Cattle, British, the number slaughtered yearly, 1
 —, the aggregate value of, *ib.*
 —, average mortality of, *ib.*
 —, the diseases of, too much neglected by all veterinary writers, *ib.*
 —, ditto, in the principal English veterinary school, 394
 —, the state of, in the middle ages, 7
 —, the average weight of, in 1710 and 1830, 257
 —, the proper points of, generally, 12
 —, the intelligence of, 285
 —, wild, account of, 7
 —, dealing system of, in the south of Scotland, 138, 162
 Caustics, those used in cattle practice, 580
 Cavan, the principal improvers of the breed of cattle in, 182

- Chalk, its utility in the treatment of dysentery and diarrhoea, 485, 584
- Chamomile, its tonic properties, 580
- Charge, Mr., an account of his fat seven-year-old ox, 235
- Charges, the use of, and the method of applying, 580
- Cheese, Cheddar, an account of, 30
- , Cheshire, account of, 207
- , Gloucester, history of the manufacture of, 38
- , single and double, the difference between, ib.
- , North Wiltshire, account of, 218
- Cheshire cattle, account of the, 205
- , the short-horns, introduced with doubtful advantage, 206
- Chest, the advantage of a capacious one in cattle, 12
- , the proper form of, 367
- Chloride of lime, the value of, 584, 443
- Chlorine gas, might it destroy worms in the bronchial tubes? 399
- Choking in cattle, treatment of, 415, 418
- Chyle, its nature and formation, 468
- Clackmannan, account of the cattle of, 121
- Clare, the principal improvers of the breed of cattle in, 183
- Cleansing.—See Placenta.
- drink, the best, 545
- Cleveland, character of the cattle in, 249
- Clouted cream, description of, 23
- Clue-bound, treatment of, 449, 451
- Clydesdale.—See Lanarkshire.
- Clysters, the benefit of, 580
- Coates, Mr. G., the author of the 'Short-Horned Herd Book,' 234
- Colic, flatulent, its symptoms, nature, and treatment, 488
- , spasmodic, its symptoms, nature, and treatment, 489
- , too often leads on to strangulation of the intestines, ib.
- Colling, Mr. Charles, at the very head of the improvers of the short-horns, 228
- , supposed principally to aim at their improvement by reducing the size of the breed, ib.
- , an account of the cross of his cattle with the Galloway, 230
- , a detailed account of his sale of the improved short-horns, 231
- , Robert, a successful improver of the short-horns, 233
- , the sale of his stock, ib.
- Colon, description of the, 467, 470
- Colours, the prevailing ones of cattle, 242
- Constipation, the treatment of, 495, 558
- Consumption, nature and treatment, 409
- , the peculiar cough of, 411
- , delusive character and progress of, 412
- Copper, the compounds of, used in cattle practice, 581
- Cordials, the use and abuse of, ib.
- Cords, the nature and treatment of, 490
- Cork-screw probang, description of the, 419
- Cornish cattle, description of the native, 24
- Cornwall, a sketch of its agriculture and commerce, 24
- , management of dairy cows in, 25
- , method of rearing calves in, ib.
- Corrosive sublimate, its use in cattle practice, 581
- , the treatment of poisoning by, 448
- Coryza, the nature and treatment of, 312
- Corstorphine cream, account of the, 146
- Cottar, the Scotch, description of the, 112
- Cows, Swiss, their vanity, 6
- poetical description of, 245
- Cows' commons, description of the, 219
- Cow-club, an account of the, 251
- Cow-pox, distinction between the true and the false, 545
- , history of its establishment as a preventive against small-pox, 555
- has not its origin in the grease of horses, ib.
- no preventive against the distemper in dogs, 556
- ditto rabies, 557
- Cow-quake, description of the, 118
- Craven, the native country of the long-horns, 188
- Cravens, two distinct breeds of, the smaller and larger, 189, 251
- Crochles in cattle, symptoms and treatment of, 563
- Cromarty, general history of, 95
- Croton, a powerful purgative, 581
- Cruelty to cattle in Smithfield, 259
- Cud, loss of the, treatment of, 445
- Cumberland, the native breed of, was long-horned, 247
- , history of the establishment of the short-horns there, ib.
- D, MR. BAKEWELL'S bull, account of, 193, 198
- Dairy cows, the number of, kept in London, 255
- , the kind of, preferred, 261
- , the system of management, ib., 265
- Denbighshire, the cattle of, 63
- Derbyshire cattle, account of, 204
- , crosses with, ib., 224
- Devonshire cattle, 23
- , general experience is against them for the dairy, 20
- ox, his activity his most valuable quality, 18
- , his qualities for grazing, 19
- , trial of his fattening properties with different breeds, 19, 31, 41
- Devon, South, the cattle of, 22, 23
- , comparison between them and the North Devons, 22
- nats, account of the, 179
- Diaphragm, rupture of the, 503
- Diarrhoea, acute, the nature and treatment of, 475
- , distinction between it and dysentery, ib.
- , chronic, the nature and treatment of, 476

- Diarrhœa, in calves, nature and treatment of, 559
 Digitalis, its medicinal properties, 582
 Distention of the rumen by food, nature and treatment of, 435
 ————— gas, nature and treatment of, 438
 Doncaster Agricultural Society, account of the, 251
 Donegal, the cattle of, 184
 Dorset ox, description of the, 26
 —————, crossed with the Devon and Durham advantageously, *ib.*
 Dropsy, general remarks on the causes and treatment of, 497
 Drying a cow, the proper period for, 534
 Dumbartonshire, the cattle of, 122
 Dumfries, the Galloways, for grazing, and the Ayrshires for the dairy there, 165
 Dun, Mr. David, the Scottish Bakewell, account of, 119
 Dung, the different qualities of that of cattle and horses, 470
 Dunlop cheese, account of the, 125, 137
 Duodenum, description of the, 467
 —————, inflammation of the, 487
 Durham ox, an account of the, 229
 Dysentery, causes and symptoms of, 477
 —————, appearances of, after death, 478
 ————— is inflammation of the mucous membrane of the large intestines, 480
 —————, treatment of it, 481
 —————, the value of the chloride of lime in the treatment of it, 484
- EAR**, description of the, 287
 —, the form and shape of, connected with the beauty of the animal, *ib.*
 —, the diseases of the, 288
 Earth, the eating of it, prevents the fermentation of the food, 317
 —, the quantity of, eaten daily by the Kintore ox, 104
 East Indian cattle, an account of the, 268
 ——— Lothian, the breeds of cattle of, 148
 —————, the short horns introduced by Mr. John Rennie, *ib.*
 Edinburgh, the Veterinary School at, has improved the treatment of cattle, 394
 Edinburghshire.—See Mid Lothian.
 Elgin, description of the cattle in, 100
 Elder, the leaves of, make a good soothing ointment, 582
 Embryotomy, when justifiable, and a description of the operation, 540
 Emetic, tartar, the use of, 579
 Enteritis, symptoms of, 472
 —————, appearances after death, 473
 —————, causes and treatment of, 474
 Epidemic catarrh.—See Catarrh.
 Epidemics.—See Murrain.
 Epiglottis, difference between that of the horse and the ox, 373
 Epilepsy, the treatment of, 300
 Epping, the manufactory of butter at, 254
 Epsom salt, the best purgative, 585
 Ergot of rye, its power in stimulating the womb to action, 535
- Essays on red-water, 511
 Essex has no distinguishing breed of cattle, 253
 —, management of calves in, 254
 — marshes, the principal mode of feeding on, *ib.*
 Exeter, description of the vale of, 23
 Eye, general description of the, 288
 —, inflammation of the, the nature and treatment of, 292
 —, worm in the, treatment of, 293
 —, wounds of the, management of, 289
 Eyelids, description of the, 290
 —, diseases of the, *ib.*
- FARCY** in cattle, supposed causes of, 313
 Fardel-hound, description of it, 449
 —————, several cases of, 451
 Falkirk, account of the tryst at, 120
 Feet, the, description of, 272
 —, diseases of the, 565
 Ferrying cattle, the method of, from the Scottish islands to the mainland, 81
 Ferocity, occasional, in cattle, 296
 Fever, intermittent, its symptoms and treatment, 355
 —, pure or idiopathic, does often exist in cattle, 354
 —————, its symptoms and treatment, *ib.*
 —, symptomatic, frequent and dangerous, 355
 —, inflammatory, its nature and treatment, *ib.*
 —, typhus, its nature and treatment, 363
 Fife cattle, description of the old breed, 115
 ————— crossed with the short-horns, 116
 —, many of the Durhams have now established themselves there, 117
 — bull, admeasurement of one, *ib.*
 — cattle, the mingling with the native breed the origin of the Aberdeens, 105
 Findlater, Lord, account of his improvements in Banff, 101
 Firby, description of Lord Althorp's bull, 241, 368, 371
 Firing, an advantageous mode of, for some bony tumours, 289
 Fits, the treatment of, 300
 Fitzwilliam, Earl of, an account of his East Indian cattle, 270
 Flintshire cattle, description of the, 64
 Flooding after calving, treatment of, 545
 Fluke-worm, the, a cause of jaundice, 464
 Fœtus, retention of it for a long time without injury, 543
 Food, its changes in the stomachs, 429
 —, how conveyed into the reticulum, 430
 —, the difference in the quantity of, very trifling in animals of different sizes, but of the same breed, 246
 Forehead of a bull, the, should be short and broad, 274
 — of Firby, description of the, 274
 — the Devon, description of, 14
 — the North Highlanders, *do.*, 97
 — the old Banff, *do.*, 101

- Foul in the foot, description of, 565
 ———, most prevalent in low, marshy countries, 566
 ———, mode of treatment of, 566
 ———, probable advantage of neurotomy in, 568
 Fowler, Mr., an improver of the long-horns, 193, 219
 ———, account of the sale of his stock, 194
 Free martens usually barren, 538
 ———, dissections of three, ib.
 ———, a few cases in which they have bred, 539
 French cattle, the chronic pleurisy to which they are subject, 407
 Frontal sinuses, description of, 273, 274
 ———, use of the, 275, 276
 ———, inflammation of the, nature and treatment of, 275
 ———, worms in the, 276
- GALLA oxen, the enormous horns of, 282
 Gall-bladder, the structure and use of, 459
 Gall-stones, their composition, 462
 ———, a frequent cause of jaundice, 463
 Galloway, the greater part of the cattle were horned at the middle of the last century, 154
 ———, the present breed of, 156
 ——— bull, a perfect one seldom found, 161
 ——— cows not good milkers, ib.
 ——— occasionally have horns, 282
 ——— farmers, description of, 163
 Galloways, Mr. Culley's description of, 157
 Gangrenous inflammation of the lungs, symptoms and treatment of, 402
 Garget, the cause of, 552, 554
 ———, the efficacy of iodine in, 553, 554
 ———, the state of the veins of the udder in, 367
 Gas, the kind of, extricated in hoove, 443
 Gavel-kind, its impediment to the improvement of agriculture, 182
 Gentian, the best tonic, 582
 Ginger, the best aromatic, ib.
 Girth, the, of cattle, should be both deep and wide, 12
 Glamorganshire cattle, early history of, 50
 ———, deteriorated when they were neglected for the growth of corn, 51
 ———, again gradually improving, ib.
 ——— hill cattle, description of them, 55
 Glanders in cattle, on, 313
 Glauber's salt, inferior to the Epsom, 586
 Gloss-anthrax, the symptoms and treatment of, 326
 Gloucestershire cattle, description of the old breed of, 35
 ———, history of the present breed in the hilly country, ib.
 ——— cheese, the good quality of it depends more upon the pasture than the breed of cows, 38
- Gloucestershire cheese, single and double, the difference between, 38
 Grains, the best method of keeping them, on a large scale, for dairy cows, 255, 264
 Grainsick, the treatment of, 435
 ———, part of the food discharged by vomiting, 437
 Gutta serena, cause and treatment of, 293
 Gut-tie, the nature and treatment of, 490
- HADDINGTON.—See East Lothian.
 Hair, cattle should be covered with a thick pile of, 13
 Hamilton, Duke of, the valuable improvements he effected in Arran, 74
 Hampshire, the breeds of cattle in, 215
 Haunch, description of the, 272
 Haw, description of the, 290
 ———, inflammation of the, ib.
 ———, method of extirpating the, 291
 Head, section of the, 273
 Healing power in animals, illustrations of the, 501
 Heart, description of the, 349
 ———, theory of its action, 351
 ———, the muscular columns and tendinous cords of it stronger in the ox than the horse, 351
 ———, a muscle running across the right ventricle, peculiar to the ox, 352
 ———, description of the bone of it, 353
 Hebrides, history and description of the, 65
 ———, the inner, the number and value of the cattle, 67
 ———, disgraceful management of cattle formerly, ib.
 ———, accounts of the misery of the cattle and the cottagers in the winter, 68
 ———, reasons of this strange mismanagement, ib.
 ———, present management, 69
 ———, no crosses with any other breed has succeeded in these islands, ib.
 ———, management of the dairy in them, 71
 ———, 20,000 cattle annually exported from them, ib.
 ———, the outer, description of the cattle of, ib.
 ———, mode of treatment, 72
 Hellebore, black, makes the best seton, 300, 583
 Hemlock, the treatment of poisoning by, 446
 Hemorrhage from the nose, on, 311
 ——— after parturition, the treatment of, 545
 Herd-book, the short-horned, compiled by Mr. G. Coates, 234
 Herefordshire cattle, description of the, 31
 ———, comparison between them and the Devons, 19, 31, 32
 ———, their propensity to fatten, 31
 ———, comparison between the old and new breed, ib.
 ———, have been crossed with advantage by the Devons, 32

- Herefordshire cattle, Mr. Culley's erroneous opinion of, *ib.*
 ——— cow, inferior in shape to the ox, *ib.*
 ——— not good for the dairy, 35
 Hernia, the nature and treatment of, 500
 ———, in calves, management of, 501
 Hide of cattle, should be thin, mellow, and not too lean, 13
 Hide-bound, the treatment of, 570
 Highlanders, comparison between them and the Welsh cattle, 61
 Hips, the, of cattle should be large and round, 12
 Hiring husbandry-horses, the old system of, in Ayrshire, 138
 Hock, description of the, 272
 Holderness cattle, the old, 248
 ———, their improvement, *ib.*
 Holmes, the, among the Shetland islands, description of the, 85
 Homer, his account of murrain, 581
 Honeycomb.—See Reticulum.
 Hooped form of the barrel, in cattle, importance of, 12
 Horns, description of the, 272
 ——— are elongations of, and hollowed like, the frontal bones, 278
 ———, the different breeds of cattle distinguished by, 9, 281
 ———, description of, in foreign cattle, 282
 ———, beautiful ones, manufactured, 281
 ———, the influence of sex on the, 282
 ———, as connected with the age of the beast, 279
 ———, the uses of, 283
 ———, the danger of cutting them, 276
 ———, fracture of them, how treated, 278
 ———, the degree of fever, how estimated by means of them, 280
 ———, tenderness of the roots accounted for, *ib.*
 Horned and hornless breeds, comparison between them, 283
 Horny covering, composition and growth of the, 279
 Hoose.—See Catarrh.
 ———, in calves, the treatment of, 559
 Hoove, the cause of, 438
 ———, symptoms and treatment of, 438
 ———, medicines administered in, do not enter the stomach, 440
 ———, objections to puncturing the rumen in, *ib.*
 ———, danger of a large incision, 441
 ———, when the rumen is punctured, it should be with a trocar and canula, *ib.*
 ———, the use of the probang, or stomach-pump, recommended, 442
 ———, the nature of the gas which is extricated in, 443
 ———, the treatment of, when the gas has escaped, 444
 ———, a singular case of, *ib.*
 Howell the Good, his laws respecting cattle, 61
 Howick red ox, an account of, 235
 Hubback, the father of the improved short-horns, account of him, 229
 Humble-cows, Dr. Johnson's curious derivation of the word, 150
 Huntingdonshire, breeds of cattle in, 209
 Hydatids in the brain, symptoms and treatment of, 294
 ———, numerous, found in the liver of a cow, 460
 Hydrocephalus, treatment of, 295
 ILEUM, description of the, 407, 467
 In-and-in, the principle of breeding adopted by Bakewell, 192
 ———, the question considered, 525
 Indian cattle, an account of the, 270
 Inflammation, the nature and general treatment of, 355
 Inflammatory fever, causes, symptoms, and preventions of, 356
 ———, treatment of, 357, 359
 Intelligence of cattle, the comparative degree of, 286
 Intestines, description of the, 467
 ———, the diseases of the, 471
 ———, inflammation of the external coat of the.—See Enteritis.
 ——— mucous coat of.—See Diarrhoea and Dysentery.
 Inverness, description of the cattle of, 81
 Inversion of the rectum, 494
 ——— womb, 544
 Iodine, the admirable use of, 583
 Ireland, the establishment of the short-horns in, 183
 Irish butter, account of, 188
 ——— cattle, the middle horns an aboriginal breed, 179
 ———, long-horns, probably derived from Lancashire, 182
 ———, two different kinds of, 183
 ———, numbers of, imported into England, 186
 Islay, island of, superiority of the cattle there, 66
 Jaundice, causes of, symptoms and treatment, 462
 Jejunum, description of the, 467, 469
 Jenner, Dr., his discovery of the preventive power of the cow-pox, 556
 Joint murrain, its treatment, 356
 Joints opened, the treatment of, 564
 ———, swellings of them, the causes and treatment of, 562
 Journeys of the Scotch cattle to the south, description of the, 122
 Jugular vein, description of the, 335
 KENT, description of the various breeds in, 46
 Kerry, the cow of, description of, 179
 Kidneys, anatomical structure of the, 503
 ———, inflammation of the, causes, symptoms, and treatment of, 514
 ———, calculi in, symptoms and treatment of, 516

- Kincardineshire.—See Mearns.
 Kinross, account of the cattle of, 121
 Kintail, account of the cattle in, 96
 Kintore ox, description of the, 103
 Knee, description of the, 272
 Kyle Rhea, description of the ferry of, 81
 Kyloe, origin of the term 66
- LANARKSHIRE cattle, account of the breeds of, 139
 Lancashire, the various breeds of, 200
 ———, many short-horn breeders in the central districts, 201
 ———, the long-horn breed has gradually declined in value there, *ib.*
 ———, fruitless experiments to restore them, 203
 Laryngites, the treatment of, 395
 Laycock, Mr., an account of his dairy, 262, 263
 Lead, the usual preparations of, 583
 Legs, the, of cattle should be short, 12
 Leicestershire, account of the cattle in, 208
 Leicester new breed, inquiry into the value of, 196
 ———, improved the whole breed of long-horns, 198
 ———, superseded by the short-horns, 199
 Leprosy, the nature and treatment of, 572
 Letting bulls, the system originated with Mr. Bakewell, 195
 ———, the advantages and disadvantages of the system, *ib.*
 Lice, how produced, and the method of destroying them, 573
 Like produces like, the grand principle of breeding, 522
 Lime, the chloride of, an excellent disinfectant, 361
 Lincolnshire cattle, description of, 242, 251
 ———, an account of the Turnhill cattle, 252
 Linlithgowshire.—See West Lothian.
 Linseed, experiments on its fattening properties, 213
 ——— meal, excellent for poultices, 584
 ——— oil, a good purgative, *ib.*
 Lip, upper, the use of the numerous glands in, 316
 Lips, description and use of, 315
 Liquids, the circumstances under which they enter the rumen, 432
 Liver, the structure and functions of, 458
 ———, on inflammation of the, 459
 ———, a case of enormous enlargement and disease of, 460
 ———, the difficulty of detecting chronic inflammation of, 461
 ———, on hemorrhage from it, 461
 ———, a case of abscess in, 460
 Lochabar, description of the cattle of, 81
 Long-horns, the, appear to have originated in Craven, 188
 ———, two distinct breeds of, the smaller and the larger, 189
 ———, Mr. Culley's account of the old, 189
- Long-horns, the, history of the improvement of, 190
 Loss of cud, nature and treatment of, 445
 ———, more a symptom of disease than a separate disease, *ib.*
 Lungs, the, their structure, 375, 400
 ———, inflammation of, symptoms and treatment of, 400
 ———, acute and epidemic, its occasional devastations, 401, 403
- MADNESS, causes and treatment of, 306
 Mandana ox, account of its docility, 5, 315
 Mange, the nature and treatment of, 571
 Manyplus, internal construction of the, 423, 424, 426, 428, 449
 ———, the manner in which it reduces the food to a pulpy mass, 433
 ———, the diseases of, 449, 451
 ———, the occasional strangely hardened state of its contents, 450
 Mawbound, the symptoms and treatment of, 435
 Mearns cattle, description of the, 110
 Meat, the average quantity of, annually consumed in London, 257
 Meath, the improvement of Irish cattle commenced in, 182
 Mercury, the different preparations of it used, 585
 Merionethshire, an inferior variety of the Angleseys in the hill district, 62
 ———, description of the better breeds of the vale, 61
 Mesenteric glands, their structure and use, 471
 ———, enlargement of them, *ib.*
 Mesentery, description of the, 467, 468
 Middle-horns, the, were probably the original cattle, 10
 Mid-Lothian, description of the cattle of, 145
 Milch-cow, the cottar's, interesting description of the, 112
 Milk, the average quantity of, yielded by the Yorkshire cow, 245
 ——— fever, its nature and treatment, 546
 ———, the importance of purging in, 548, 550
 ——— trade, the, in London, 261
 ——— vein, description of the, 340
 ———, importance of a large one, 244
 Montgomery cattle, small in the hill district, 63
 ———, in the lower country, fair milkers and good feeders, 63
 Moor-ill, the nature and treatment of, 474
 Morgan, Sir Charles, introduced the short-horns into Monmouthshire, 56
 Motor organic nerves, account of the, 335
 Mouth, account of the bones of the, 314
 Murrain, the nature, symptoms, and treatment of, 379, 380
 ———, accounts of its early appearance in Europe, 383
 ———, spreads in England, 386
 ———, contagious as well as epidemic, 388

- Murrain, experiments on inoculation with its virus, 389
 ———, its devastations led to the foundation of veterinary schools, 393
- NAIRN, description of the cattle of, 99
 Nagore cattle, an account of, 269
 Navel-ill, the nature and treatment of, 557
 Neck of cattle, description of, 332, 338, 340, 343, 345
 ———, comparison between it and that of the horse, 343
 Nerves of the leg, cuts of, 305
 Net or knot, the nature and treatment of, 489
 Neurotomy might be practised on cattle, 303
 ———, the probable advantage of it in foul in the foot, 568
 ———, description of the operation, 304
 ———, cuts illustrative of, 305
 Nitre, its value in cattle practice, 586
 Nitrous ether, spirit of it, when useful, 585
 Norfolk, the native cattle of, 171
 ——— polled cattle, their origin, *ib.*
 ——— Galloway Scots, principally grazed there, 172
 ———, its supply of fat cattle for the Smithfield market, 258
 Northamptonshire, breeds of cattle in, 209
 ———, its supply of fat cattle for the Smithfield market, *ib.*
 North Uist, the island of, comparison of breeding and grazing there, 70
 Nose, bleeding from the, 311
 ———, leeches in the, *ib.*
 ———, polypus in the, *ib.*
 ———, its membrane, inflammation of, 312
- ESOPHAGEAN canal, cuts of it, 423, 424
 Esophagus, the structure of, 414, 426
 ———, obstruction in the, treatment of, 415
 ———, the manner of opening in choking, 420
 ———, rupture of the, 421
 ———, stricture of the, *ib.*
 Estrus bovis, the history of its several states, 574
 Opened joints, the treatment of, 564
 Ophthalmia, its nature and treatment, 292
 Opium, the best anodyne, antispasmodic and astringent, 585
 Orkney Islands, the cattle of, and their treatment, 86
 Ox, zoological description of, 2
 ———, the degree of intelligence which he possesses, 4
 ———, British, early history of, *ib.*
 ———, African, docility of, 4, 5
 Oxfordshire, description of the cattle of, 214
- PAD on the upper jaw, description and use of the, 317
 Palsy, causes and treatment of, 301, 303
 Pancreas, the structure, functions, and diseases of, 466
- Pantas, the nature and treatment of, 474
 Papillæ of the rumen, description of them, and of their uses, 430
 Paps in the mouth, treatment of, 337
 Parotid glands, inflammation of the, symptoms and treatment of, 335
 Parturition.—See Calving.
 Paunch.—See Rumen.
 Pembrokehire cattle, description of, 48
 Pericardium, inflammation of the, 350
 ———, the, often penetrated by sharp substances that have been taken into the rumen, *ib.*
 Perthshire, an account of the various breeds of cattle in, 118
 Pharyngites, the symptoms and treatment of, 394, 395
 Pharynx, description of the, 337
 ———, inflammation of the, 394, 395
 ———, the mode of puncturing it in abscess situated there, 396
 Phrenzy, symptoms and treatment of, 296
 Phthisis.—See Consumption.
 Placenta, the retention of it, in abortion, 532
 ———, the, should be discharged soon after calving, 545
 ———, method of separating it from the womb, *ib.*
 Pleurisy, its symptoms and treatment, 405
 ———, chronic, symptoms and treatment of, 407
 Pleuro-pneumonia, interesting account of it, *ib.*
 Pneumonia, the symptoms and treatment of, 400
 ———, acute and epidemic, 401
 Points of cattle, a description of the principal, 12
 Poisons, a list of the various, and the mode of treating them, 445
 Polled cattle, an account of the, 154
 ——— and horned cattle, a comparison between them, 283
 Polypus in the nose, on, 311
 Poultices, when useful, 586
 Probang, the use of, in hoove, recommended, 442
 Pregnancy, the usual period of, 527
 ——— symptoms of, 533
 Presentation, natural, the management of, 534
 ———, unnatural, *do.*, 536
 Puck, the disease so called, 362
 Puncturing the rumen in hoove, objections to, 441
 Puerperal fever.—See Milk Fever.
 Pulse, cause of the, 353
 ———, importance of attention to the, *ib.*
 Purgatives, the usual beastly method of administering them, 330
 Purging cattle, the occasional difficulty of, accounted for, 431, 496
 ———, the method of proceeding when this occurs, *ib.*
- QUARTERS, importance of their being long and full, 15

- Quarter-evil, its nature and treatment, 356
 ———, a peculiar kind of, in the North Riding of Yorkshire, 362
 Queen of Scots, Mr. Mure's beautiful heifer, a description of her, 166
- RABIES, the causes and symptoms of, 306
 Radnorshire cattle, much crossed with the Herefords, and a valuable breed, 58
 Rectum, description of the, 467, 470
 ———, the treatment of inversion of, 494
 Red-water, the nature and causes of, 504
 ——— has more to do with the digestive organs and the food than any other cause, 505
 ——— is most frequent in low marshy woody countries, *ib.*
 ———, acute, the nature and treatment of, 506, 507
 ———, the importance of bleeding and purging in, *ib.*, 510
 ———, chronic, the nature and treatment of, 508, 509
 ———, the prize essays on it in the 'Quarterly Journal of Agriculture,' 511
 Renfrewshire, the old breed there superseded by the Ayrshire, 125
 Reticulum, the interior construction of it, 424, 426, 427
 ———, the action of it in the return of the food to the stomach, 424, 430
 ———, the diseases of the, 448
 Rheumatism, the cause and treatment of, 561
 Rhodes, Messrs., an account of their dairy, 262, 263
 Ribs, the number and proper form of, 367
 Ribbed home, the importance of being, 12
 Riding oxen in Mandara, an account of the, 5, 315
 Rings, the, on the horn, as indicating the age, 279
 ———, ———, uncertainty of, 80
 Ross, description of the cattle in, 96, 97
 ———, the different crosses of cattle in, 97
 ——— the cattle generally more adapted for grazing than the dairy, 98
 ———, average produce of the cows, *ib.*
 Rottenness.—See Dysentery.
 Rumen, the, viewed externally, 422, 423
 ——— internally, 424, 426
 ———, general description of it, 425, 427
 ———, description of its papillæ, and their uses, 429
 ———, the fluid swallowed sometimes enters it, 431, 496
 ———, this accounts for the occasional difficulty of purging cattle, 431, 496
 ———, an account of the diseases of it, 433
 ———, the strange substances often found in it, *ib.*
 ———, calculi in the, symptoms of, 434
 ———, the effect of, 435
 ———, distention of it by food, the symptoms, and treatment of, 435, 436
 ———, ——— gas, 438
 ———, inflammation of the, 436
- Rumination, description of it, 432
 Rupture of the parietes of the abdomen.—See Hernia.
 ——— of the bladder, symptoms of, 520
 ——— œsophagus, treatment of 421
 ——— womb, treatment of, 542
 Rutlandshire has no peculiar breed, 208
 Rye, ergot of, its use in parturition, 586
- SALIVARY glands, description of the, 332
 Salt, its use in food as a medicine, 556
 Sapped.—See Constipation.
 Saphena vein, the, when it should be opened, 348
 Scotch cattle, description of their journey to the south, 122
 Scott, Sir Robert, first introduced turnips into Kincardineshire, 112
 Selkirkshire, the original breed of cattle in, 153
 Septum, the nasal, why not perfect in the ox, 309
 Setons, their occasional use, 586
 Shealings, description of the, 72, 81
 ———, Mr. M'Lean's admirable remarks on them, 82
 Sheep husbandry compared with that of cattle, unanswerable defence of, 117
 Sheeted ox, description of it, 28
 Shetland Islands, general description of them, 84
 ———, description of the cattle there, 85
 ———, treatment of the cattle, *ib.*
 Shewt of blood, its nature and treatment, 356
 Shoe of the ox, description of it, 569
 Shooting.—See Dysentery.
 Short-horns, the, history of, 226
 ——— supposed to be originally imported from the Continent, *ib.*
 ———, description of the old unimproved ones, 227
 ———, the commencement of their improvement, *ib.*
 ———, the mode in which their improvement was effected, 228
 ———, their excellence consists in a combination of qualities before believed to be incompatible, 226
 ———, the question of their capacity for work, 241
 ———, their early maturity should preclude their being put to work, *ib.*
 ———, the prevailing colours of, 242
 Short-horned bulls, the advantage of crossing different breeds with them, 240
 ——— cow, her milking qualities much improved lately, 246
 ———, an account of the cross between it and the Kyloe, 247
 Short-sighted, many cattle appear to be, 392
 Shoulders, a slanting direction of them, the importance of, 14
 Shropshire cattle, the old, 225

- Shropshire cattle, the cross between them and the Holderness, 225
 ———, the Herefords prevail through the whole of the county, *ib.*
 Silver, nitrate of, its use as a caustic, 587
 Sinclair, Sir John, the great improver of cattle in Caithness, 88
 Skeleton of the ox, cut of the, 272
 Skibo, description of the small breed of cattle so called, 94
 Skin, the cause and importance of its soft mellow feeling, 570
 ———, diseases of the, *ib.*
 Skull, cavity of the, cut of, 273
 ———, fracture of the, treatment of, 293
 ———, almost invariably fatal, *ib.*
 Slinking.—See Abortion.
 Smelling, on the sense of, 309
 Smithfield, the average number of cattle and sheep annually sold there, 256
 ———, the yearly numbers of cattle sold there from 1732 to 1830, *ib.*
 ———, parts of the kingdom by which it is supplied at different periods of the year, 258
 ———, the mode of sale there, *ib.*
 ———, cruelties practised there, *ib.*
 Snake, a, in the gullet of a cow, the cause of hoove, 444
 Soft palate, description of the, 337
 Somerset, Mid., description of the cattle, 28
 ———, North, ditto, *ib.*
 ———, West, ditto, *ib.*
 ———, principally devoted to grazing, 29
 Sore teats, treatment of, 552
 ——— throat, the symptoms and treatment of, 395
 Speed, the disease so called, 362
 Spinal cord, the comparative smallness of, accounted for, 287
 Spine, comparison between it in the ox and horse, 372
 Spleen, structure and function of the, 457
 ———, hemorrhage from the, 458
 Sprain in the leg and foot, symptoms and treatment of, 564, 565
 Staffordshire, the old cattle of, 222
 ———, history of the improvement of the cattle, 222
 ———, description of the present long-horns, 223
 ———, a cross between them and the Derbyshire cattle, 224
 Staking, several cases of, 451
 Sternum, description of the, 367
 ———, the width of the, sometimes compensates for flatness of the sides, 371
 Stimulants, the propriety of administering, when it is difficult to purge cattle, 431
 Stirlingshire, the general management of cattle in, 119
 Stomachs of cattle, cuts of them, 422, 423, 424, 426
 Stomach-pump, the use of it in hoove recommended, *ib.*
 Stone in the bladder, symptoms and treatment of, 518
 ——— in the kidneys, ditto and ditto, 516
 ——— ureters, ditto and ditto, 517
 ——— urethra, ditto and ditto, 519
 St. Pancras, the establishment of a veterinary school at, 394
 Strangulation of the intestines, symptoms and treatment of, 489
 Strangullion, description of it, 336
 Strathaven, the management of calves there, 140
 ———, the cruelty sometimes practised, 141
 ———, account of extraordinary calves reared there, *ib.*
 Stricture of the œsophagus, treatment of, 421
 Subcutaneous abdominal vein, the question when it should be bled from, 348
 ———, the anatomy of it, 349
 Sublingual glands, description of the, 337
 Submaxillary vein, description of the, 335
 ——— artery, ditto, 335
 Suffolk cattle, were originally duns, 174
 ———, description of the, *ib.*
 ———, milking properties of, 175
 ———, the bull cast off far too early, 177
 Sulphur, an excellent purgative and alterative, 587
 Summerings of cattle in Wexford, description of them, 184
 Surrey has no distinguishing breed, 265
 Sussex oxen, description of the, 40
 ———, resemblance and difference between them and the Devons, *ib.*
 ———, ditto, Herefords, 41
 ———, their working qualities considered, 42
 ———, curious instance of the speed of one, 43
 ———, average weight of, *ib.*
 ——— cow, description of her, 44
 ———, not good for the dairy, *ib.*
 ———, extraordinary quantity of milk and butter yielded by one, 45
 ———, a breed of black cattle in, 46
 ———, West, no distinguishing breed in, *ib.*
 Sutherland, general description of, 91
 ———, decrease of the breed of cattle in, *ib.*
 ———, strange increase in the number of sheep in, *ib.*
 ———, comparison between the former state of cattle husbandry and the present state of sheep husbandry, 92
 ———, the manner in which the change was effected, 93
 ———, its happy effects, *ib.*
 ———, description of the breed of cattle in, 93
 Sweetbread, description of the, 375
 Swelling of the joints, the causes and treatment of, 562
 Swiss cattle, illustrations of vanity in, 6

Swiss cattle, curious account of, as connected with consumption, 413
 Switzerland, the disposition of cows to abortion at the setting in of hoar frost, 533

TAIL, description of the bones of the, 272
 —, should be level with the bones of the back, 15

—, description of it generally, 302

— slip, ridiculous notions of it, 301

Tankerville, Lord, account of the wild cattle in his park, 8

Tape-worm, an account of the, 497

Tapping in dropsy, a description of the operation, 498

Tar, its use in cattle practice, 587

Taunton, the vale of, description of the cattle in, 27

Tavistock, the South Devons purest about, 22

Teeth, the form and structure of them, in ruminants, 318

—, regarded as indicating the age, *ib.*

—, cuts of them, at different ages, 319, &c.

—, curious process of diminution of, commencing at three months, 319

—, when the mouth can be said to be full of, 322

—, the grinders, the age imperfectly estimated by, 324

Tempest, Sir H. Vane, first introduced the short-horns into Ireland, 184

Temporal artery, description of the, 335, 337
 — bone, description of the, 372, 374, 384, 315

— vein, description of the, 335

Tetanus, symptoms and treatment of, 298

Thighs, they should be full, long, and close together when viewed from behind, 12, 15

Thigh-bone, description of the, 272

Thrush in the mouth, symptoms and treatment of, 331

Thymus gland, description of the, 365

Tibia, or leg-bone, description of the, 272

Tipperary, description of the cattle in, 185

Tongue, description of it and its uses, 324
 — of the horse, reason of its being tied down by the spur of the os-hyoides, 326

— ox, reason of its not being tied down, 326

—, method of distinguishing between that of the horse and ox, 373

Tonics, when admissible in the treatment of distemper, 486, 587

Torsion, the method of castration by, 560

Trachea, description of the, 373

Tracheotomy, description of the operation of, 374

—, cases in which it should be performed, *ib.*

Trysts, the, of Inverness and the North, description of them, 83

Tumours, bony, about the eye, management of, 289

Tumours, bony, about the eye, an advantageous way of firing, 289

Turnhill cattle, description of the, 252

Turnips, history of the first introduction of them into the Mearns, 112

—, introduced into Berwickshire in 1755, 150

Turpentine, liquid, its uses as a digestive and a diuretic, 587

—, oil of, its medicinal use, 587

— might possibly destroy the worms in the bronchial tubes, 399

Typhus fever, nature of the, 363

—, frequently follows inflammatory fever, 364

—, symptoms of, *ib.*

—, treatment of, 365

—, the kind of cattle most subject to, *ib.*

—, prevention of, *ib.*

Tyree, the island of, comparison between the profits of breeding and grazing there, 70

Twopenny, Mr. Bakewell's bull, account of, 193

UDDER, description of the, 245

Ulcers, foetid, use of chloride of lime for, 361

University of London, the establishment of a veterinary school at the, 394

Upper jaw-bone, description of the, 272, 309, 314

Ureters, description of the, 515

—, larger than in the horse, *ib.*

—, stone in the, symptoms and treatment of, 517

Urethra, description of its curve, *ib.*

—, stone in the, symptoms and treatment of, 519

Urinary calculi, symptoms of their presence, 516, 517

—, composition of, 516

Urus, account of the ancient, 3

VANITY, illustrations of, in cattle, 6

Veins, the largeness of, in the ox, compared with the arteries, 374

—, description of the, 366

—, varicose, the nature and treatment of, *ib.*

Verdigris, its use in cattle practice, 584

Vertebrae of the spine, description of, 272

Veterinary schools, their origin, 2, 393

—, their establishment put an end to the epidemics which devastated Europe, 393

—, establishment of that at Edinburgh, 394

—, St. Pancras, *ib.*

— the University of London, *ib.*

Vinegar, of little use in cattle practice, 588

Virgil, his beautiful description of the murrain, 381

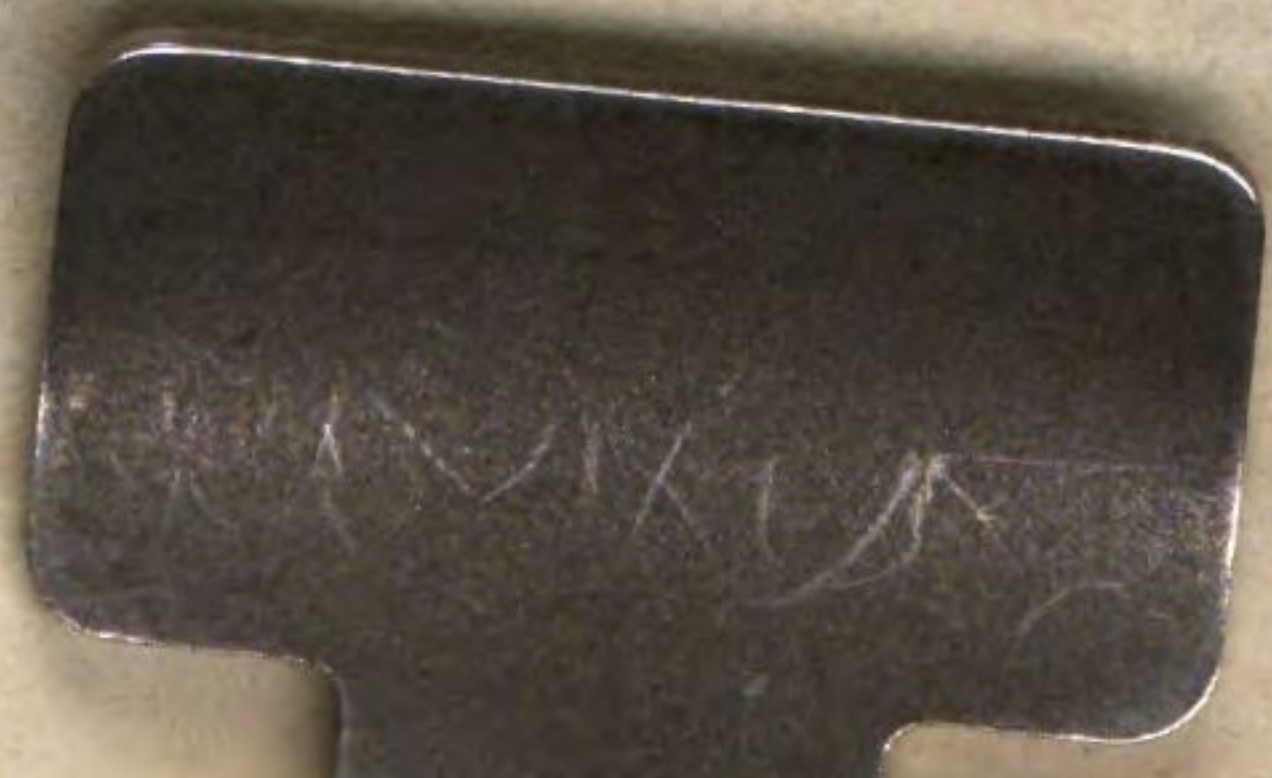
Vitriol, white, the use of, 588

- "Voice of Humanity," the, recommended, 259
 Vomiting, how far it may be produced, 456
 ——— true, rare and attended with danger, *ib.*
 ———, a case of, 457
 WAISTELL, Mr., the original proprietor of Hubbuck, 229
 ———, account of his fat four-year-old ox, 235
 Waller, Messrs., the first improvers of Irish cattle, 182
 Warbles, how produced, 574
 ———, history of the fly and its several states, *ib.*
 Warts, their nature and treatment, 576
 Warwickshire, the cattle of, 220
 ———, the long-horns still prevalent there, *ib.*
 Water in the head, symptoms and treatment of, 295
 ——— drop-wort, the treatment of poisoning by, 446
 Webster, Mr., of Canley, an improver of the long-horns, 190, 220
 Wilby, a farrier, stands first among the improvers of the long-horns, 190
 Welsh cattle, the, were some of them white with red ears, 48
 Western counties, their supply of fat cattle for the Smithfield market, 258
 West Highland cattle, the points in which they are valuable, 67
 ———, the secret of profitably breeding and grazing them, 79
 West Lothian, description of the cattle, 144
 ———, management of them, 144
 Westmorland cattle, account of the, 200
 Wexford, management of cattle in, 184
 Wicklow, description of cattle in, 34, 185
 Wight, Isle of, description of the cattle, 215
 Wild cattle, account of, 7
 Willowbank, account of the dairy at, 141
 Willoughby, Sir C., first introduced the short-horns into Oxfordshire, 219
 Wiltshire, North, description of the cattle there, 215
 ———, until lately occupied by the long-horns, 217
 ———, value of the present cross-breed, *ib.*
 ———, method of rearing in, 217
 ———, cheese equal to the Gloucester, 218
 ———, South, description of the cattle of, *ib.*
 Wind-pipe, description of the, 373
 Wintering grounds of Dumbartonshire, description of, 122
 Withers, hollowness behind them, disadvantage of, 15
 Womb, inversion of the, treatment of, 541
 ———, rupture of the, ditto, 542
 Wood evil, nature and treatment of, 474
 Worcestershire, description of the cattle of, 221
 ——— contains some of the best Herefords, 221
 ———, the Herefords and Durhams struggling for superiority on the grazing lands, 221
 Worms in the frontal sinuses of cattle, 276
 ——— in the eye, treatment of, 293
 ———, an account of the various intestinal ones, 496
 Wortley farmers' club, an account of the, 251
 Wounds of the eye, management of, 289
 YELLOWS, the (see Jaundice), 462
 Yew, the treatment of poisoning by, 446
 ——— eaten with impunity by the cattle in Hanover and Hesse, 447
 ——— mixed with other food may be eaten without danger, *ib.*
 Yorkshire cow, the history of the establishment of the present one, 243
 ———, description of her, 244
 ———, average quantity of milk yielded by her, 245, 261
 ———, the question of the average quantity of butter, 245
 ———, East Riding, an account of the cattle of, 251
 ———, North Riding, description of the cattle of, 248
 ———, the native cattle of, were long-horns, *ib.*
 ———, account of the first Holderness established there, *ib.*
 ———, history of their improvement, *ib.*
 ———, general management of, 249
 ———, the cows principally supply the metropolitan dairies, *ib.*
 ———, West Riding, description of the cattle of, 250
 ———, the prevalence of the half-horns accounted for, *ib.*
 Young calves, the danger of taking them too soon from their dams, 310
 ZINC, the preparations of it which are used medicinally, 338
 Zygomatic arch, the peculiar construction of it in the ox, 277
 Zygomaticus muscle, description of the, 338

17-



17-



17-



Armatage, George

Cattle their breeds, management, and diseases ; with an index

London 1842

Enc. 139 t-2

urn:nbn:de:bvb:12-bsb10401365-7